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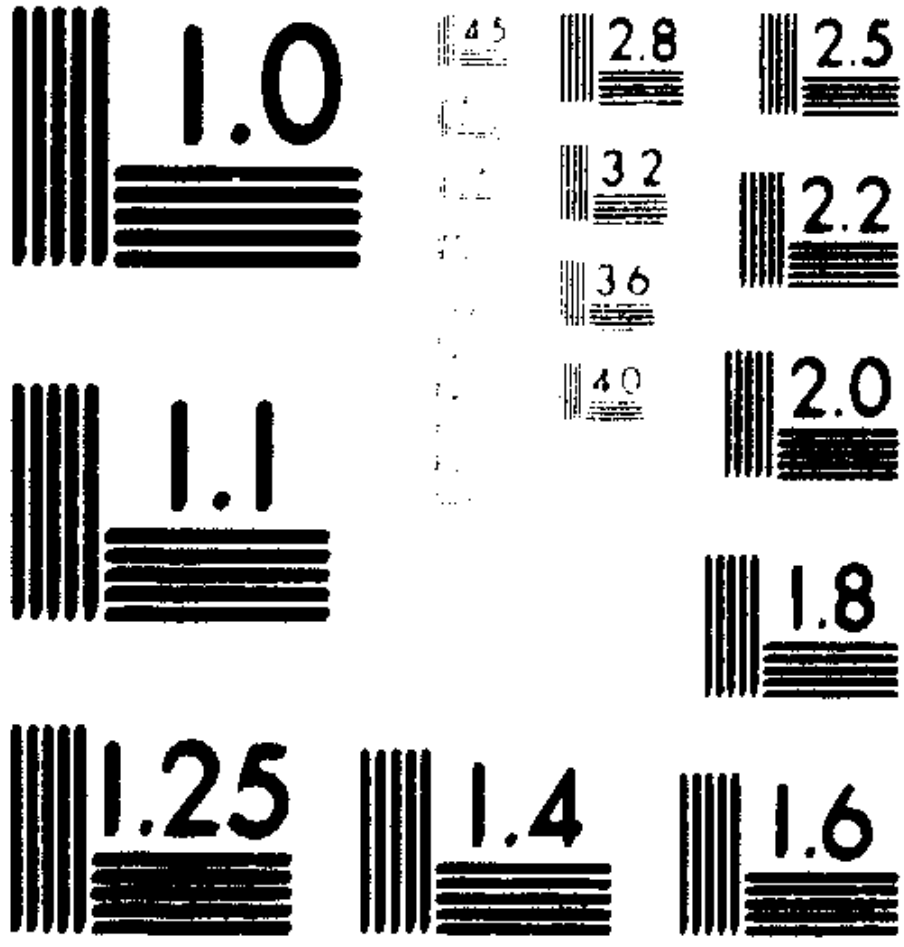

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NATIONAL REGISTRY FOR
TECHNOLOGY TRANSFER
DP/EGY/78/001
EGYPT

R) Technical report: Establishment of a national office for the supervision of technology agreements*

Prepared for the Government of Egypt
by the United Nations Industrial Development Organization,
acting as executing agency for the United Nations Development Programme

Based on the work of V.R. Arni, expert in transfer of technology

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United Nations Industrial Development Organization
Vienna

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Explanatory notes

References to dollars ($) are to United States dollars.

The monetary unit in Egypt is the pound (£.E.). During the period covered by this report the value of the pound in relation to the United States dollar was $US = £.E.0.700

The following abbreviations have been used in this report:

ASRT	Academy of Scientific Research and Technology
ECWA	Economic Commission for Western Asia
EEC	European Economic Community
EIDDC	Engineering Industrial Design Development Centre
GAFI	General Authority for Foreign Investment and Free Zones
GDP	Gross domestic product
GOFI	General Organization for Industrialization
IMF	International Monetary Fund
MM	Million
PCT	Patent Co-operation Treaty
TAT	Transfer and Adaptation of Technology
TNC	Transnational corporation
TOT	Transfer of Technology
TTC	Technology Transfer Centre
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNCTAD	United Nations Conference on Trade and Development
USAID	United States Agency for International Development
WIPO	World Intellectual Property Organization

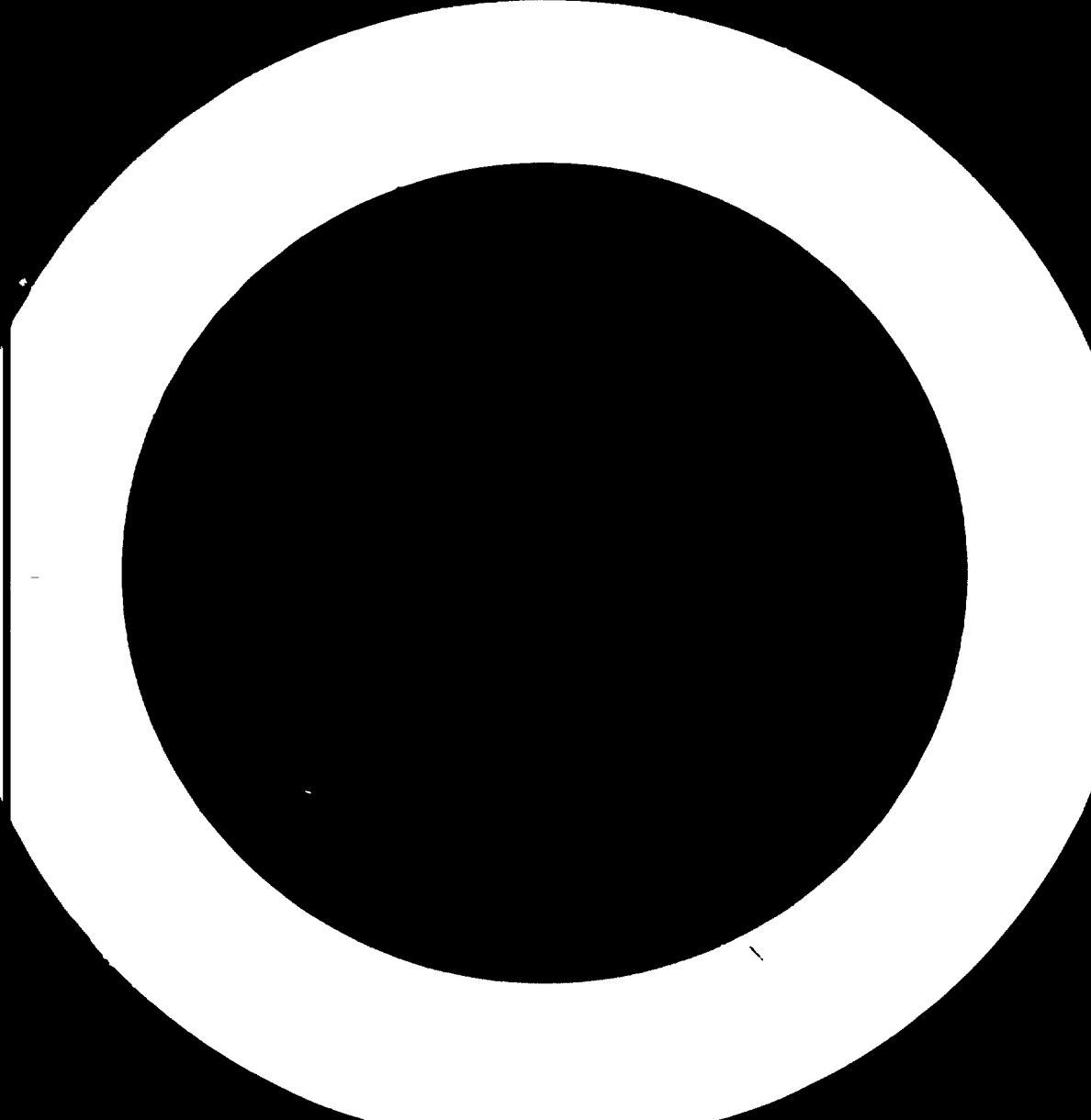
ABSTRACT

A short-term mission undertaken by the United Nations Industrial Development Organization (UNIDO) in 1975 established that there was a need for a co-ordinated system for the registration, evaluation and approval of foreign technology proposals in Egypt. A request for technical assistance in this area was submitted by the Government of Egypt and consequently the project "National Registry for Technology Transfer" (DP/EGY/78/001) was approved by the United Nations Development Programme (UNDP) on 13 February 1979 and UNIDO designated to act as the executing agency.

The aim of the project is to assist government insitutions through adequate training and expert advice in the establishment and organization of a national registry of technology transfer, including the required legislation; in the appraisal of foreign technology proposals; and in the legal evaluation of licensing agreements. A total of 65 man-months has been approved for this purpose.

The expert in transfer of technology, whose mission of three months is covered by the present report, arrived at Cairo in January 1980. His main duties were to analyse existing governmental policies, institutions and linkages with respect to technology transfer, to evaluate existing appraisal and approval procedures, to develop policy options open to the Government in the creation of a national office for technology transfer, to define the role and functions of such an office as well as recommend its policy framework and its placement in the governmental decision matrix.

The expert prepared four working papers which were discussed with the counterparts and he recommends that the existing Technology Transfer Centre (TTC), now under the administration of the General Organization for Industrialization (GOFI), be transformed into a national centre for the appraisal of technology agreements. The main functions of this centre are described in his report. He further recommends that all project approval bodies subscribe to a common transfer of technology (TOT) policy - an interim policy having been developed by the expert - which should be administered by the TTC. The expert views the TTC as an interim structure until new legislation will give it independent authority to act as a recommendatory secretariat to project-approval authorities and he makes suggestions for the functional placement and the composition of representatives on the future TTC.



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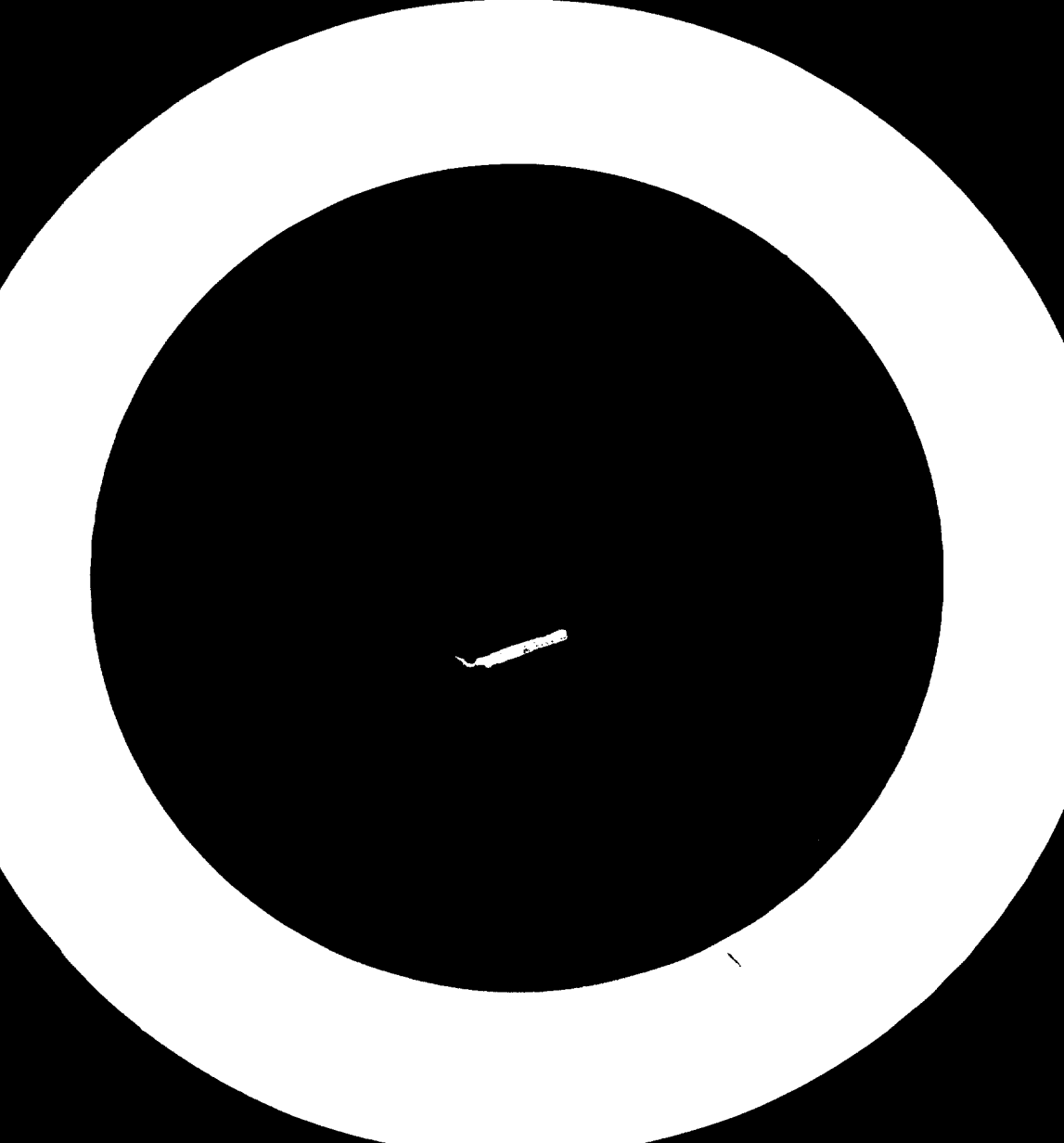

SECTION I: SUMMARY OF REPORT

PROJECT BACKGROUND

Egypt's Open Door Policy (1974) places great reliance on foreign technology and investment for the rapid industrialisation of the country, consistent with national socio-economic goals. This important Policy commits the Government to design and strengthen appropriate institutional infrastructure to meet the objectives of the Policy, recognising the complex problems associated with the transfer, adaptation and development of technology. The Government of Egypt requested UNIDO to assist the General Office for Industrialisation (GOFI) in examining existing institutional machinery dealing with technology transfer and reviewing with Egyptian authorities the experience of developing countries. In accordance with the Government's request, a short-term Mission was undertaken by UNIDO, the findings and recommendations of which were published in a report UNIDO/ISID.125 (20 Nov. 1975). The report recommended the need to establish a technology policy in the country, one of whose objectives would be the design of a coordinated system for the regulation and promotion of foreign technology. UNDP Project Document No. DP/EGY/78/001/A/01/37 (Feb. 13, 1979) defines the basic outline of an overall 33 man-month programme through UNIDO assistance. The Programme enlists the utilisation of international experts to offer assistance in areas as the establishment of a National Office of Technology Transfer, development of legislation, preparation of guidelines for the evaluation of licensing agreements and the training of key-personnel of the office. In a second (1979) short-term Mission undertaken by UNIDO (Mr. E. Aguilar), at the request of GOFI, it was decided that the arrival of

international experts (initially two experts) should follow a study Tour to be undertaken by a team of three GOFI officials to regulatory offices in Mexico, Spain, Phillipines and the Republic of Korea. The Study Tour completed (Oct. 1979), the Expert who presents this Report arrived in Cairo on a three-month Mission. (January-March 1980).

The duties of the Expert (Expert in Transfer of Technology) were defined as follows:

(i) to analyse existing governmental policies, institutions and linkages with respect to transfers of technology to Egypt

(ii) to evaluate existing approaches and procedures for the appraisal and approval of transfers of technology

(iii) to develop policy options open to the Government in the creation of a National office for Technology Transfer (termed Technology Transfer Centre in this Report)

(iv) to recommend the policy framework under which the National Office should function

(v) to define and recommend the roles and functions of the National Office

(vi) to recommend the placement of the Office in the Governmental decision-matrix

(vii) to advise on considerations relating to the authority structure for the National Office

(viii) to identify topics and specific issues calling for study on the part of the office and make suggestions for follow-up action by UNIDO

(ix) to assist in the organisation of seminars and workshops on the problems and perspectives of technology transfer at the national level.

METHODOLOGY OF THE MISSION

At the very beginning of the Mission it was recognised that certain conflicting issues were present in Egypt which had to be resolved or accepted before the purposes of the Mission could be pursued. The first of these was that a 'National Office for Technology Transfer' would not be feasible within GOFI (as was defined in the Original Job Description(DP/EGY/78/001/ 31.3.A) as many important technology-using sectors, as petrochemicals, pharmaceuticals, etc. were outside the jurisdiction of GOFI. Second, a 'national office' for transfer of technology associated with foreign investment (joint-ventures) had already been created under Law 43 of 1974; the General Authority for Foreign Investment and Free Zones (GAFI) being the relevant, independent and central authority. Third, a National Centre for the Transfer and Development of Technology had been recommended by an UNCTAD Mission (Nov. 1978) which was to be affiliated to the Academy of Scientific Research and Technology (ASRT). This the Academy had renamed and constituted as the Egyptian Centre for Transfer and Adaptation of Technology (TAT), attached to the office of the President of the Academy, governed by a 'National Board of Technology Transfer'. Fourth, the concepts prevailing in GOFI's Technology Transfer Centre (TTC), the organisation created by GOFI as a 'regulatory office' for the transfer of technology had the view that its prime responsibility would be the evaluation of technology that was being transferred to Egypt and over which GOFI had jurisdiction.

The first three issues were immediately referred to Mr. S.J. SZIVOS, SIDFA, UNDP, Cairo and to UNIDO, Vienna. On the basis of these consultations, the Expert has advised to accept the conflicting position with respect to the ASRT-UNCTAD effort but at the same time to seek advise from senior officials of GOFI, and thereafter, to review the situation with GAFI and ASRT. This procedure was adopted, with the Mission then being permitted to view the overall problem of technology regulation without special constraint.

The fourth issue was basically resolved within GOFI after the Expert explained the limited scope that was available for evaluation of technology. The substantial dangers of unsupervised transfers of technology were highlighted to impress upon the TTC the need for critical appraisal of technology contracts. For the particular Egyptian situation, however, it was soon found that a conventional regulatory office would have limited usefulness. Its coverage had to be substantially larger.

These efforts led to the redefinition of the Job Description (see above) after endorsement by the Industrial Institutions Section, UNIDO, Vienna.

Partly because of the above situation, and partly on the recognition that Government departments concerned with the acquisition of technology were not adequately aware of the factors in technology management, it was arranged, in consultation with counterparts, that four 'Working Papers' be prepared by the Expert, discussions on which would lead to the

final recommendations of the Mission.

Contemporaneous to this approach, arrangements were made by counterparts for general discussions with senior officials of GOFI, GAFI and the Academy which opportunity was taken to indicate the need for a coordinated national approach to technology transfer.

Three Working Papers on the following subjects were first prepared (over a period of six weeks):

Working Paper I: Operational ambit of the TTC

Working Paper II: Technology Policy and TTC

Working Paper III: Functional Placement of the TTC in the Egyptian Governmental System.

Full-day discussions on each of the Working Papers were held with counterparts so as to obtain some commitment from them to the general approach to the Mission. In all meetings three senior officials of GOFI were present: Mr. A.M. Nosseir, Dr. M.A. Aglan and Mr. Mohamed Amin. For Working Papers I and III, Mr. Abdel Aziz of GOFI's legal department was present. Based on discussions, the Working Papers were modified and circulated to members of the TTC and to senior officials of GOFI.

Working Paper IV on 'Considerations in Authority Structure for the TTC' was to have been prepared after the first three papers had been reviewed by GOFI, GAFI and the Academy and discussions with them. These discussions were not feasible and hence Paper IV was only discussed within the TTC towards the end of the Mission.

In the last four weeks of the Mission, a series of talks was given by the Expert on subjects as restrictive practices, the functioning of regulatory offices in different developing countries, terms in licensing agreements, evaluation of technology payments, risk management in the application of technology in the economic sectors and technology utilisation in the Public Sector. Attempts to hold Seminars or symposia with the participation of authorities concerned with technology transfer were not successful.

For many reasons, discussions with the Ministries of Petroleum, Health, Agriculture, etc, which were necessary for meeting the requirements of the Mission, were not feasible.

Again, for lack of an adequate information system in GCFI it was not possible to review executed technology agreements or to obtain consistent statistical data.

Meetings with the Patent office, the Trademarks Registry and the Central Bank, necessary from the viewpoint of providing an information base to this Report, were, again not feasible.

FINDINGS

Taking 1975 as the base year, Egypt's perspective planning calls for a four-fold enhancement in per-capita in income; from 100 L.E. in 1975 to 400 L.E. in 2000 (1975 prices). In order to achieve this, with the population almost doubling over this period (to 67 million in 2000), GDP needs to grow eight-fold. Egypt finds it infeasible to obtain substantial contribution from agriculture as development potential in this sector, over the 25 year period, is limited. Surplus from agricultural income furthermore, would be insufficient to provide planned social amenities (education, health, welfare). Thus Egypt's planners rely heavily on the industry and service sectors for social and economic development. The agricultural component of GDP is expected to drop from 29.4% to 8.4% over the 25 year time span, and for the industry and service sectors to improve their shares from 27.7% and 23.5% to 37.6% and 40.9%, respectively. In absolute terms, industrial production needs to increase nine-fold representing an annual compound growth-rate of 9%, which is about 3% higher than historical experience 1960-1970.

The Government announced its "Open Door Policy" in 1974 giving industrialisation the highest priority, seeking such through heavy injections of foreign technology and investment and the aggressive development of the Egyptian private sector. Significant new legislation has been enacted to provide incentives, facilities and guarantees to firms which engage in industrial activity. The most

important law is Law 43 (of 1974) which relates to foreign investment. The Government's stress in these areas, in effect, reverses a 20 year emphasis on industrialisation through the agency of the Public Sector.

In the last five years, Egypt's planners have placed great emphasis on both the modernisation of existing industry and its exposure to market forces. At the present time, almost the entire industrial production system is within the Public sector which produces about 65% of all the country's goods. (capital, intermediate and consumer goods). The balance of production is largely with some 15000 small scale firms which employ less than 10 persons per enterprise.
These latter firms produce goods as leather articles, wood and metal furniture, wearing apparel, small forging and castings, building materials as bricks etc. with minimum reliance on industrial techniques. The technology employed in the Public Sector is of the early 1960's, outmoded, with poor productivity and low value-addition. The Government's emphasis on modernisation of the industrial structure is essentially an emphasis on the introduction of viable technology, the application of advanced industrial techniques and the introduction of modern methods of management.

Egypt's plans call for the creation of virtually three new sectors of industrial activity: (1) the joint-venture sector (2) a large unit's private sector and (3) a modern small-units private sector. The Public Sector is expected

to undergo a transformation through renovation, rehabilitation and modernisation of production facilities and production systems, such being achieved through the agency of foreign technology. New capacity creation is also an urgent necessity as the country relies very heavily on imports to meet production deficiencies in areas as steel products, cement, etc.

It is well-recognised that absence of adequate policy instruments, weaknesses in existing technological and industrial policies, over-centralisation of authority, steep pyramidal structures in public sector enterprises, poor coordination between ministries, and the like, together with digressions from industrial focus due to wars, have led to production inefficiencies, inadequacy of revenue and poor attention and receptivity to market needs.

Very basically, Egypt's present policies, including the Open Door Policy, address themselves to correcting the industrial economy, precedent to accelerated growth. Besides requiring the diversification of the industrial structure, the policies aim at decentralisation of decision-taking in Governmental administration, improvement of management efficiencies, the development of a stable and consistent information system and the establishment of necessary linkages between policy and implementation.

Egypt realises, however, that large injection of foreign technology, undoubtedly needed to correct the economy, must be supervised. There is recognition that the socio-economic structure of a developing country can be severely strained and adversely affected if foreign investment and technology are introduced

without discretion or direction. Unguided, technology itself, as well as the terms under which it is acquired, can cause unacceptable distortions in societal structure which may also become well-nigh irreversible. On the one hand, inappropriate and inconsequential technologies (or market rights masquerading as technologies) may flood and imbed themselves in the country, and on the other, the cost of technology or the controls imposed on the use of it, could commit the country to outflows of funds which can seriously endanger its balance of payments position. Further uncontrolled acceptances of technologies can increase, rather than decrease, the country's technological dependence; while dampening and underutilising indigenous capabilities.

This need for technology supervision has been felt by many Egyptian organisations as GOFI, ASRT and GAFI. From 1975, various attempts have been made to obtain the assistance of international organisations so as to establish supervisory or regulatory bodies. ASRT has established linkages with UNCTAD and the EEC; GOFI with UNIDO; and GAFI, itself a regulatory body for joint-ventures (law 43) has sought UNIDO assistance, on a spot basis, for the monitoring of complex technology/joint-venture agreements, while recognising the need for strengthening its bargaining power with respect to foreign enterprises.

Presently, the rate of influx of modern industrial technology into Egypt, through licensing, is quite modest (even by developing country standards). The rehabilitation and modernisation of the Public Sector is largely being effected through machinery imports and the balancing of production lines, with very little inputs of licensed technology. Organised private sector industry (Egyptian capital), to the extent it prevails, is primarily utilising machine-embodied technology.

GOFI's figures reveal, for illustration, that although (about 800 projects were approved in its sector in 1979, only 8 projects involved the use of technology through licensing. In the case of joint-venture projects (Public and private sectors), GAFI's mid-1979 data reveal that it has approved 287 industrial (inland) projects over the last seven years, involving (at the utmost) an average of about 45 agreements per year.

However, accelerated licensing in all sectors is expected now onwards because the 'growth phase' of the economy is particularly evident and the Israel-Egypt Peace Treaty heralds a long-term political stability to Egypt.
In terms of technology transfer a viable situation exists. There are no entrenched pressure groups in Egypt. Transnational corporations, while they are beginning to enter industry in a large way, do not now have a 'local presence' and lobbying power. Similarly, there are no foreign enclaves (plantations, etc) and, therefore, vested foreign interests. Equally, there are no concentrations

of economic power in private sector industry. There is conspicuous absence of trade union agitation or unrest. And finally, all key national resources, as petroleum or minerals, are wholly in the control of the Government, outside of power blocs as the Arab oil cartel or the TNCs.

A broad implication of the above-described environment is this: if Egypt can devise forthwith comprehensive policy instruments for the proper channelling and supervision of foreign technology and investment, the country may be able to pursue its socio-economic objectives without having to pass through those phases, encountered by other developing countries, where entrenched foreign and domestic monopolistic or oligopolistic systems have to be first dismantled or moderated before industrial development or social justice can be attempted.

Egypt has not enacted any laws specific to technology licensing. The basic legislative right for the Government to intervene in the process of technology acceptance is, however, present in Laws 21/1958 and 43/1974. While the laws are basically oriented to industrial licensing - the right of a firm to establish a manufacturing unit - there is authority in them for the government to examine technology agreements. Law 43 would apply when the agreement is between parties in joint-venture and Law 21 for the private Egyptian sector. There is no specific law covering acceptances of technology by Public Sector enterprises but authority is believed present in sets of law governing the creation of public organs.

In existing systems and forms of Governmental administration in Egypt, the approval authority for projects, and technology agreements associated with projects, is with several Ministries, GOFI and GAFI, depending on their fields of jurisdiction. That is, project-approval authority is decentralised.

Egypt has a multi-agency system for the appraisal of projects in terms of their techno-economic feasibility and socio-economic contribution. In the cases of agricultural products (as pesticides), pharmaceuticals, petrochemicals, etc, the approval and appraisal bodies are usually one and the same, the concerned Ministry in the case of products that are the responsibility of the Ministries of Industry, housing, etc, the appraisal body is usually GOFI; for industrial products that are objects of joint-venture enterprises techno-economic appraisal would be carried out by the Ministry or organisation that has the necessary evaluatory expertise.

At the present time, all appraisal bodies tend to focus more on techno-economic feasibility and the suitability of the production-system (machinery, components, tools) than on appraisals of the technology to be employed or of the contractual terms under which it is offered. In the case of technology per se, inadequacy of attention is due to an insufficient information system; in the case of contractual terms, the deficiency lies in expertise.

Both GOFI and ASRT have now established Technology Transfer Centres with the objective of technology supervision. The objectives of these centres are now complementary in character rather than conflictive. ASRT has redefined its interests in terms of science-technology and technology-industry linkages with emphasis on needs for technology adaptation and the testing of the suitability of technology offers in the context of the Egyptian environment. GOFI's interests are now predominantly in the area of appraising contractual terms in technology agreements and evaluating the impact of foreign technology on domestic capabilities and their development. GOFI, GAFI and ASRT all recognise the need for a 'national approach' to technology transfer. Since their viewpoints are different by virtue of their expertise and objectives, all these bodies recognise the need of a coordinating policy which establishes the national approach namely, A Technology Policy.

One of the major anomalies of the technology environment in Egypt is that direct transfers of technology, unaccompanied by investment, have neither adequate channels for entry into the country - institutional structures such as GAFI - nor is there clear policy - as Law 43 - to attract and employ them. Without a parallel incentive mechanism for direct transfers of technology, Law 43 stands in the position of having institutionalised technology 'packaging'. There is thus a need for developing incentive mechanisms for direct transfers of technology.

RECOMMENDATIONS

1. Since a national approach to technology transfer and the supervision of technology agreements is desired by the Government, and since in the existing system of administration, decision-authority for projects, and technology agreements associated with projects, is decentralised and distributed among several Ministries and organisations, and it is impractical to divide such authority so as to centralise decision-authority for technology agreements alone, or from the viewpoint of the Open Door Policy to create new regulatory legislation to govern all transfers of technology, it is recommended that the optimum mechanism for technology management would be to organise a central-appraisal agency for technology agreements.

2. The Technology Transfer Centre (TTC) now under the administrative control of GOFI, can be transformed to become a national centre for the appraisal of technology agreements and such is recommended. It is proposed that the TTC should develop into a single, central and specialised unit with the major objective of serving as a recommendatory secretariat to all authorities approving technology agreements. TTC, in this concept, will not have the character of a decision-body in any matter concerning contractual arrangements between parties to a technology agreement. Each project-approval body in final terms would continue to be the 'regulatory body' over those areas that come within its jurisdiction.

3. Since straight-forward decentralisation in the final approval of technology agreements can introduce subjectivity and arbitrariness to the criteria applied by different project-approval bodies for acceptances of contractual terms, and this is undesirable in any concept of a national approach to technology transfer, a concomittant requirement is a coordinating instrument. It is recommended that this instrument should be policy under the title of 'Transfer of Technology Policy' (TOT Policy) to which all project approval bodies, and the TTC, would subscribe to. Properly framed and constructed, the Policy should lead to a consistent, clear and stable system for the supervision of technology inflows.

4. In consideration of the large new efforts being made by Egypt to rapidly transform its economy through heavy injections of technology, it is recommended that the TOT Policy should have a wider perspective of technology purpose than merely be a coordinating instrument. First, TOT Policy should incorporate a parallel instrument to Law 43 (a procedure) so as to provide a channel for direct transfers of technology. That is, the TOT Policy should be the means through which 'unpackaged' technology is provided incentives (i.e. through royalties, etc) for entry into the country. Second, approvals of foreign technology, and terms of its acceptance, should not, by inattention or disregard, have unanticipated adverse impact on other sectors of the economy or hurt or hinder their expected development. TOT Policy, it is presented, should

have its placement in, and be a subordinate policy to, a parent or principal policy, a Technology Policy, one that assigns the functions of technology in the matrix of society. (Section V). In the recommendation made, the TOT Policy is the governing policy for the acceptance of contractual terms in technology agreements; the reasons, purpose and limit of governance would be set out in Technology Policy.

5. Till the time a Technology Policy is formulated (Section V) and specific expression given to the role of foreign technology in Egypt, it is recommended that an Interim TOT Policy should be developed to guide the TTC and the project-approval bodies based on the general needs and experience of developing countries modified by well-understood aspects of the Egyptian economic and industrial environment. (A draft Interim TOT Policy is developed and presented in Section V of this Report.)

6. It is recommended that as a subscriber to TOT Policy, the main role of the TTC would be:

   (i) to administer the TOT Policy, to the extent permitted by the Policy, with assistance given to the formulators of the Policy as required, and

   (ii) to act as the central appraisal unit for transfers of technology, bringing to the task the necessary support and expertise.

7. It is recommended that the main functions of the TTC should be:

(i) to review and evaluate in technology agreements, involving foreign technology, through legal, economic and technical screening disciplines.

(ii) to render technology advisory services to interested potential users of foreign technology, including Egypt's Public Sector enterprises.

(iii) to assist interested parties on matters relating to the negotiation of agreements (without participation, except where required, by Public Sector institutions)

(iv) to serve as a documentation and collation centre for technology agreements and on statistical financial information relating to technology payments, and

(v) to obtain representation on Committees approving projects which are associated with licensed technology.

8. One of the major challenges before Egyptian planners is to identify the industries wherein foreign investment, management and technology, together or separately, can make their major contribution. It is recommended that the TTC should effort to reward and penalise technology-users and technology-suppliers so as to achieve the ' 'allocation exercise' in Technology Policy (Section V)

9. In order that the TTC can serve as a central appraisal unit for foreign technology and at the same time avoid foreign technology and for investment damaging other sectors of the economy, it must have certain established linkages with decision-bodies as GAFI or the Ministries on the one hand, and functional bodies as ASRT or the small-industries Directorate on the other. TTC's linkages must be reciprocally balanced by its mandatory duties. Certain essential information, it is recommended, must flow from the project-approval body to the TTC and from the TTC to the approval body. (Section V).

10. In its ideal form, the TTC would be an interim structure till new legislation (not recommended by the Mission) gives it independent authority as a central regulatory organisation. The specific presentation of the Mission is that the TTC should be organised to act as a recommendatory secretariat to project-approval authorities. It is desirable to isolate it from pressure groups, necessitating that the TTC be solely governed by (and respond to) a newly-constituted Central Board of Technology Transfer, separate from Ministerial Administration. However, since the TTC is concerned with very tangible matters of industry promotion and management, and not science-technology linkages (except indirectly), either the Central Board should have majority composition of industry representatives or the TTC should be functionally

governed by a sub-committee of the Board wholly composed of representatives of industry management (GAFI, GOFI, the Ministries of Health, Agriculture and Petroleum).
It is further recommended that the Central Board set the TOT Policy under which the TTC, and the project-approval bodies will operate.
(The term 'Central Board of Technology Transfer is not to be confused with ASRT's National Board of Technology Transfer).

SECTION II: INTRODUCTION TO EGYPT

This Report is concerned with policies relating to the management of technology in Egypt. Although there is much in common in the approach of Third World countries to the subject, the geographical position, factor endowments and historical background of a particular country substantially influence emphasis in the application of general policies. Therefore, prior to entering into the mainstream of this Report it would be relevant to outline the geographic and demographic features of Egypt, its historical evolution and the general economic industrial environment.

GEOGRAPHY

Egypt is situated in the north-eastern corner of Africa, with two coast lines--that of the Mediterranean and the Red Sea. On the world map it has a crucial position as it is sited at the cross-roads of trade among the countries of Africa, Europe and the Far East. The Suez Canal has been a major international waterway since 1869.

The most important internal geographic feature of Egypt is the Nile River - a natural resources which sustains the country's entire agriculture. The river drains into the Mediterranean and makes the 'Delta' a fertile and major settlement area. The Delta, and the long narrow Nile Valley, accounting for about 4% of the land mass, accommodate virtually the entire population of the country. 96% of Egypt is desert.

Cotton (introduced in early years of the Nineteenth Century) is the most important crop of Egypt. The fine alluvial soil and the humid environment of the Delta permit the cultivation of a long-staple cotton of exceptional quality. Arable land being a scarce resource, it is intensively cultivated (multiple cropping) yielding through crop rotations, maize, sugarcane, rice, wheat, citrus fruit, vegetables and cloves, the last supporting for sizeable livestock population.

The desert provides many raw materials - petroleum (500-600,000 barrels per day), natural gas, iron ore, phosphate, limestone, natrum (natural sodium carbonate), gravel and fine sand, and manganese ore. However, these resource availabilities are not such as to affect the geopolitics of the region in which Egypt is situated.

DEMOGRAPHIC FEATURES

As per the 1966 Census (the last held), Egypt had a population of 30.6 million. The current estimate is 40.5 million. Since the World War II, it is estimated that the population has been growing at the high rate of 2.4%. Because virtually all of this population is settled in 4% of the land area, population density is over 1000 persons per square kilometer, one of the highest in the world.

A particular feature in Egypt's demography is high urban concentration. It is estimated that 48% of the population lives in the urban area of five cities, with Cairo and Alexandria burdened with 27% of the country's entire population. As in other developing countries, this population increase has been accompanied by a large lower-age bracket, substantial annual additions to the work force, significant underemployment, rural migration to cities, urban social tension, and very significantly, pressures on agriculture and on the social infrastructure.

52% of the population is estimated to be in the rural areas but the percentage in decreasing. Because of a substantial amount of seasonal employment, it is difficult to estimate the labor force that is wholly employed in agriculture. However, it is estimated that only 13% of the total employed labor force is in industry.

The literacy rate has now reached 44% from around 30% in 1960.

HISTORICAL PERSPECTIVE

The known history of Egypt can be traced back to 7000 years. The home of one of the great divilizations of the world, it has both influenced, and been influenced by other civilisations as the Judaic, Greek and Roman. At the cross-roads of trade with the Far East and African regions, and unprotected by natural defenses, the country has been a target for invaders for he last 2000 years - Persians, Greeks, Roman, Byzantines and Circassian Mamluks, in the older historical period, and the (Turkish) Ottomans and the British in the history of the last 500 years, of which

the "British period" covers 60 years. Egypt was under the 'control' of the French for only a few years under Napoleon Buonaparte.

The period from 1805 can be divided into three time-spans: (1) that beginning with the rule of the great Mohammed Ali*/ Khedive of Egypt (Ottoman Empire) 1805-1892, (2) the 'British period' 1892-1952 and (3) the Post-Revolution period, 1952 to the present.

The industrialization of Egypt was first attempted by Mohammed Ali through the agency of foreign experts, who at the peak period, numbered some ten thousand. An able innovator and entrepreneur, Ali, planned to transform a subsistence economy into a modern state. He sought to increase the country's agricultural potential so as to enhance the exports of agricultural products, to reduce imports through development of Egypt's raw materials, and to build up arms production for his military campaigns. Such development both ensured his personal security and enabled him to pay tribute to the Ottoman Porte. In this pursuit the State became both the principal owner of all cultivated land and the monopoly buyer and seller of the country's produce. During the period of Ali's rule (1805-1849) Egypt's irrigation system expanded greatly while the manufacture of sugar, edible oils, indigo (with Indian experts), cotton and coarse woollen textiles, cast iron products, small arms and warships started and proliferated.

Egypt's growing cotton exports, however, acted as a beacon attracting foreign traders, foreign banks, foreign companies and, of course, European interests. In 1838 Britain concluded a major trade treaty with the Ottomans, a provision of which was the abolition of state ownership of land in Egypt and free trade with Egypt. Deprived of revenue, on the one hand, and unable to give tarriff protection to the 'infant industry', on the other, the country moved to place its sole reliance on cotton exports. Industrial development stagnated.

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*/ Most of the material that is covered in this section is based on two books:
(1) The Egyptian Economy (1952-72), Robert Mabro, Clarendon Press (1974).
(2) The Industrialization of Egypt 1939-1973, Robert Mabro & Samir Radwan, Clarendon Press (1976).

The Khedives who followed Mohammed Ali further strove to increase the cultivation of cotton and to deepen the infrastructure supporting it. For meeting the cost of these objectives, paying the tribute due to the Turkish rulers and for funding their extravagant living, the Khedives ran up a huge Public Debt, substantially financed by foreigners.

Although the Cotton Famine of 1861-64 (brought on by the American Civil War) put Egypt on the map of the World as a major supplier of cotton, the country's export surpluses were frittered away in trying to repay the Debt or meeting its interest payments.

All the trappings of colonial economy were present even before the British took control of Egypt in 1892. Besides an economy focussing on a primary agricultural product, favoured under the principle of comparitive advantage, there was an exploitable class of wealthy landowners, 1,5% of whom held 44% of the agricultural land of which 11% was in foreign ownership.

Britain continued to develop this lopsided one-product economy, now bringing to bear on it an expanding railway system, harbours and canals. Britain also moved to improve the fiscal framework, brought into play law and order mechanisms, and introduced social legislation in favour of the fellah so that agriculture could become more price-responsive. The colonial power also encouraged an Egyptian political elite who used Government patronage to enhance and protect their landownership. Except for some cotton-ginning and processing plants - under foreign ownership- little diversification of industry took place. The British strongly believed in laissez-faire and only industries that were 'naturally protected' survived - sugar, beer and building materials being prominant of this group.

The economic position in Egypt began to change from 1920 on account of negative causative factors - the demands and exigencies of World Wars I and II and of the Great Depression in the intervening period. The Depression knocked the bottom out of the cotton export market, putting a severe test to the principle of comparative advantages. Industrial diversification became a necessity. In 1922 Bank Misr was formed wholly-owned and managed by Egyptians and signalled a new change. Simultaneously, the last of bilateral tarriff treaties concluded by Egypt came to an end in 1930, now allowing it to impose tarriffs. By 1940, 21 companies affiliated with the Bank were in productive areas as textiles, building materials, fisheries, mining

and pharmaceuticals; and in service sectors as maritime transport, insurance and tourism. World War II reinforced the growing industrial trend and many consumer products, durable and non-durable, began to be introduced.

Although increasingly large amounts of land were brought into cultivation through extensive irrigation, and multi-cropping introduced to produce cereals, vegetables and the like, further development of agriculture could only be obtained through large injections of capital. However, burdened with discharging its huge public debt, while permitting interest and profit repatriation on private commercial loans and direct foreign investment, Egypt had very little capital to ploughback. The large landholders,who held a disproportionate amount of total land,spent their income on conspicious expenditure rather than on industry. Simultaneous to these events, a population explosion was taking place. Egypt which was a labor-short economy even as late as 1900 became a labour surplus one. The land-man ratio began to attain crisis proportions. Social tension and the anti-colonial spirit of the times combined to form a situation which culminated in the Revolution of 1952.

Post-revolution developments

The Revolution had a simple and definite economic programme and the political will to carry it through. Foremost of its aims was land reform, legislation for which was introduced within six months of the Revolution. The land Reform law sought to remedy a situation in which the richest, some 2000 of them, owned 20% of the land, and the poorest, some two million, 13%.

The creation of new land was the second objective. Long-shelved plans for the Aswan High Dam were reactivated. Western foreign assistance was sought. When this was refused, the Suez Canal was nationalised in the argument that its revenues would now finance the Dam. The British and French reacted over the nationalisation resulting in the 1956 War but not only the Canal stayed Egyptian but the Government sequestered all British and French industrial interests and property.

This facilitated the third objective of the Revolution which was to rapidly industrialise the country through large public sector investment. In 1961, the Government nationalised practically all private industry, trade and banking. National planning charted out a diversified path and Egypt began to develop on the basis of self-help. Some 200 Public Sector Co-operations were formed. However, till 1974, progress was uneven. Two Wars were fought between 1961 and 1974 and substantial resources were directed to military needs.

In 1974, Egypt announced its Open Door Policy making possible large inputs of foreign technology and investment. In 1977, Egypt initiated peace talks with Israel and in 1979 a treaty of peace was signed between the countries.

ECONOMIC AND INDUSTRIAL ENVIRONMENT

The objective here is to provide some general background on the current economic-industrial situation in Egypt so that the 'transfer of technology environment' (Section IV) can be seen in perspective. However, it is extremely difficult, if not impossible, to obtain either comprehensive or consistent economic and industrial data on Egypt because of well-recognised inadequate information systems and lack of inter-Ministerial Co-ordination.

For the purpose of this Report, it would be sufficient if a semi-quantitative understanding of the environment could be achieved. This alone is attempted in the following discussion.

The GNP of Egypt (at market prices) has shown the following trend:

Unit: MM.L.E. */

1973	1974	1975	1976
3778.4	4084.9	4712.5	5673.9

(Price base not known)

The GNP in 1976 stood at 4519 MM.L.E. distributed as follows:

Unit: MM.L.E.

Agriculture	1327	- 29.4 %
Industrial Production	805	- 17.8 %
Electricity	55	- 1.2 %
Petroleum	194	- 4.2 %
Construction	200	- 4.5 %
Distribution Sector	876	- 19.4 %
Services Sector	1062	- 23.5 %
	4519	100 %

(Price base not known)

*/ MM = Million; L.E. = Egyptian Pounds.

The total investment expenditure in 1975 was as follows:

	Unit: MM.L.E.
Industry, petroleum and minerals	256
Agriculture and irrigation	90
Transportation and communication	198
Electricity	27
Housing and construction	57
Services sector	103
	731

The distribution of GDP between the public and private sectors, in 1975, was :

Public sector 53.2% of GDP
Private sector 46.8% of GDP

In 1974, exports and imports were as follows:

Exports 594.3 MM L.E.
Imports 920.1 MM L.E.

The composition of imports in 1974 was:

	Unit: MM.L.E.	
Fuel	23.5	2.6%
Raw materials	294.0	31.9% *
Intermediate goods	315.8	34.3%
Capital goods	124.5	13.5%
Consumer goods	161.8	17.7%
	920.1	100.0%

(* wheat 238.0 MM L.E.)

Five main components of "intermediate goods" were:

	Unit: MM.L.E.
Greases, fats and oils	46.3
Organic and inorganic substances	47.7
Fertilizers	29.3
Sawn timber	25.4
Iron bars, reimforcing iron, etc.	22.5
	171.2

Egypt's 1974 exports were constituted of:

Fuels	8.5%
Raw cotton	47.0%
Raw materials	6.5%
Semi finished goods	14.4%
Finished products	23.8%
	100.0%

Since Egypt's export earnings through cotton and cotton fabrics is substantial and important, the following figures for 1975 are presented:

	Unit: MM L.E.
Cotton exports	370.7
Cotton yarn	162.4
Cotton woven	221.4
Other cotton processed	93.7
	848.2

constituting 54% of all exports.

To obtain an idea of the level of production of certain products in Egypt, the following information for 1974 is presented:

Crude oil production	6.9 million tons
Iron ore	1.3 " "
Cotton yarn	179,000 tons
Rayon	5,300 "
Passenger cars	9,600 units
Agricultural tractors	1,260 "
Steel reinforcing bars	282,000 tons
TV sets	68,000 units
Refrigerators	55,000 "
Fertilizers	100,000 tons (N)
Writing paper	30,000 tons
Washing soap	570,000 tons
Sugar	576,000 tons
Cement	3,200,000 tons

Egypt's direction of trade is as follows (1974):

	Imports (%)	Exports (%)
Arab countries	6.2	7.2
East Europe	25.0	54.8
West Europe	35.8	19.9
Asia	4.0	15.7
Africa	0.8	0.7
American countries	18.6	1.5
Elsewhere	9.6	0.1
	100.0%	100.0%

No consistent data is available on Egypt's growth rate. It is estimated that in the second half of the 50s GDP grew at 5.5% per year (constant prices), 6.0% during 1960-65 and slowed thereafter. Since the 'Open door policy' (1973) the rate is currently estimated at 9-10% per annum (GDP).

The per capita income in 1974 was 100 L.E.

It is estimated by Government that there are "some" 200 principal public sector firms in the industrial sector producing 65% of the country's manufactured goods. It is also estimated that there are some 15,000 small establishments to the private sector.

It is estimated by the Government that the private sector industry has invested approximately 300 million LE in the period 1976-80 mostly in food processing and textiles.

The following is illustrative of the growth in the production of the private and public sectors (wholly Egyptian capital) between 1970-77.

	Public Sector	Private Sector
1970	988 MM L.E.	333 MM L.E.
1977	1990	793 MM L.E.

The production break up of the private (wholly Egyptian) sector in 1976 was as follows (value terms):

Textiles	26.2%
Foodstuffs	22.9%
Chemicals	9.0%
Engineering	8.7%
Wood and leather	30.3%
Building materials	2.7%
	100.0%

The number of private sector projects approved by the General Organization for Industrialization (GOFI) in the period 1974-77 is as follows:

	No.of Projects	Av.Capital per Project
1974	358	19,100 L.E.
1975	740	67,100 L.E.
1976	693	94,800 L.E.
1977	504	107,000 L.E.

The total number of workers in the private industrial Egyptian sector was estimated in 1977 to be about 21000. Aggrigate labour employment in Egypt is divided equally between the public and private sectors.

The Joint venture sector is the most dynamic in the current economy. As of mid 1979 the General Authority for Investment (GAFI) had approved 1006 projects in Egypt, 'inland' and 'free zone'. The following is illustrative of trends:

Inland projects	678 numbers
Free zone projects	328 "
	1006 numbers

Inland projects:

Manufacturing :	285 numbers
Non-manufacturing:	393 "
(tourism, investment, banking, contracting etc)	
	678 numbers

Capital distribution (inland projects) is as follows:

Unit: Mil L.E.

	Local Capital	Foreign Capital
Manufacturing	282,598	284,210
Non-manufacturing	495,585	872,792
	778,183	1,157,002

Joint venture manufacturing interests (inland) are distributed as follows (mid 1979):

	Number	Total investment
Textiles	14	579 MM L.E.
Food and beverage	19	49 "
Chemical	23	66 "
Wood products	5	12 "
Building materials	17	206 "
Metallurgical	9	17 "
Pharmaceutical	3	4 "
Mining and Petroleum	3	2 "
Engineering	10	52 "
	103	987 "

Planning for year 2000

Egypt's current economic and industrial policies are geared to the year 2000. Thus, the quantitative targets of this outpost year would be relevant:

Per capita GDP increase - 4 fold over 1975 from 100 LE to 400 LE (1975 prices)

Population - 67 million compared to 37.2 million in 1975

Total investment - 1975 - 2000 - 275 billion US dollars

GDP increase - - from 4519 MM LE (1975) to 31083 MM LE (2000) at 1975 prices

Share of agricultural income in GDP - from 29.4% in 1975 to 8.4 % in 2000

Share of industrial income in GDP - from 17.2% in 1975 to 22.5% in 2000

Share of services - from 23.5% of GDP to 40.3%

The main foreign exchange sources of the economy are: *

Suez Canal Revenues:	600 MM L.E. (1979)
Petroleum Exports:	1350 MM L.E. (1979)
Tourism	650 MM L.E. (1979)
General Exports	600 MM L.E. (1979)
Remittances from overseas Egyptians	2000 MM L.E. (est.1979)
	5200 MM L.E.

* The Egyptian Gazette Febr.12,1980

The Industrial Scene

The public sector dominates the production sector of Egypt, manufacturing capital, intermediate and consumer goods (durable and non durable). Most of the production facilities are outmoded and thus the 1978-82 national plan allocates very high priority to the rehabilitation and modernization of as many as 115 of the 200 public sector plants. The plan also accords high priority to the house building sector and civil infrastructure (bridges, roads, etc). However, Egypt's Helwan Steel Complex and the public sector cement plants, are unable to meet demands for building materials and hence very substantial imports are necessary. Although long established, and immense in size, the 'value-added' in these enterprises is quite small, heavy reliance being placed on imports. Thus, Nasr Automobiles is essentially an assembly plant for passenger cars. The lack of skilled factory labour and construction labour -who have migrated to the oil-rich Arab States - delays construction as well as the efficient working of plants. Again, the lack of modern management 'technology' leads to excessive finished product inventories which adversely affects profitability and 'ploughback'.

There is conspicuous absence of private sector industrial activity, particularly in large and medium size units. In the last three or four years, under the open door policy, a few small units have developed but in low value-adding industries as soft drinks and plastics conversion units.

There are some 15000 very small units in 'industry' in establishments employing less than 10 persons. They are in areas as wood and metal furniture, printing, wearing apparel, iron smithy, auto repair, etc.

Likewise, there is little of TNC investment in Egypt with the private sector. TNCs are predominantly associated with the public sector in joint ventures. Even so, it is estimated that less than 10% of TNC (and foreign) investment is in industrial production. However, both Government and foreign firms are looking towards the development of a private sector in Egypt. The International Monetary Fund is willing to make loans available to private sector firms if they can usefully employ large foreign exchange inputs.

The U.S. Agency for International Development, the World Bank, the EEC countries are equally willing to fund Egyptian industrial development but currently most of the funds are being diverted to the economic infrastructure.

While Egyptian capital in joint vetures is increasing, the position at the end of 30 June 1979 indicates foreign interests controlling 65% of equity capital (Source: The General Authority for Investment and Free Zones). As stated earlier, most of the foreign invesment is in non industrial areas (tourism projects, investment companies, contracting projects, housing projects. etc).

GOVERNMENTAL ADMINISTRATION

The Arab Republic of Egypt has a republican form of government in which the chief of state is the President of the Republic. The President is the nation's chief executive officer and the commander-in-chief of its armed forces. He appoints one or more vice presidents. He also appoints the Prime Minister who is consulted on the President's selection of cabinet ministers. The President also appoints the governors who administer Egypt's 25 governorates.

The President is nominated by Parliament and elected in a national plebiscite to a 6-year term. The cabinet is headed by the Prime Minister, who appoints deputy prime ministers to supervise groups of Ministers under them. The latter are organized by area of specialization. In 1977, for example, there were five deputy prime ministers for: Economic Affairs, Social Development and Services, Foreign Affairs, War and Military Production, Electricity and Energy.

The Legal System

Egypt's legal system, which is modeled on that of France, includes lower, upper, appeal and supreme courts of justice. Even should foreign laws apply, Egyptian courts have jurisdiction in all cases involving Egyptian parties.

The Egyptian judiciary has preserved a great deal of integrity and independence over the years. Judges cannot be forcibly retired, and they are subject only to the rulings of the Supreme Constitutional Court.

Egypt's Civil, Commercial and Criminal Laws are modeled on French Law. Islamic conventions only apply to 'social laws' (Inheritance, marriage, divorce, etc.).

Egypt is a member and signatory to Paris Convention (1939) on Industrial Property, WIPO and the Patent Co-operation Treaty (PCT). Egypt has an examining system and patents are valid for 15 years and Industrial Designs 10 years. The Patent office is affiliated to the Academy of Scientific Research and Technology.

Likewise, Egypt is a member of international conventions on trademarks. The Trademarks Registry is under the Supervision of the Ministry of Commerce.

Placement of the Ministry of Industry

Figure I illustrates the placement of the Ministry of Industry in the general framework of Governmental administration. The figure also indicates the placement of two key organizations which are associated with transfers of technology: (1) the General Organization for Industrialization (GOFI) and (2) the General Authority for Foreign Investment and Free Zone (GAFI, for short).

123 Public Sector Companies report to the Ministry of Industry, 77 to other Ministries.

The General Organization for Industrialization (GOFI)

GOFI is a successor organization to the General Organization for the Execution of the Five-Year Industrial Programme and was established in 1958. It is a body with a juridical status and has a Board of Directors whose Chairman is the Minister of Industry and Mineral Wealth. It is situated in the Ministry of Industry. The day-to-day operations of the Organization is directed by the Deputy Chairman of the Board (presently, Eng. Ibrahim Mohamed Sharkass). By the definition of its functions, (which are presented below) it would appear as solely a promotional and advisory body. However, in practice, it has been delegated authority by the Ministry of Industry to take executive decisions in matter of issuing Industrial Licenses (see Section III), exercising import control, etc. GOFI essentially is concerned with products and services that come within the jurisdiction of the Ministry of Industry.

The Organization structure of GOFI is presented in Figure II.

GOFI employs 1300 persons of which 800 are engineers, technicians and commercial staff.

The functions that GOFI perform are listed below:

1. Formulation of industrial development plans and defining industrialization policies, to serve the public and private Egyptian sectors, as well as the Joint Venture Sector.

2. Collecting data concerning industrial production and assistance in the dissemination of information on technical and technological innovations and know-how.

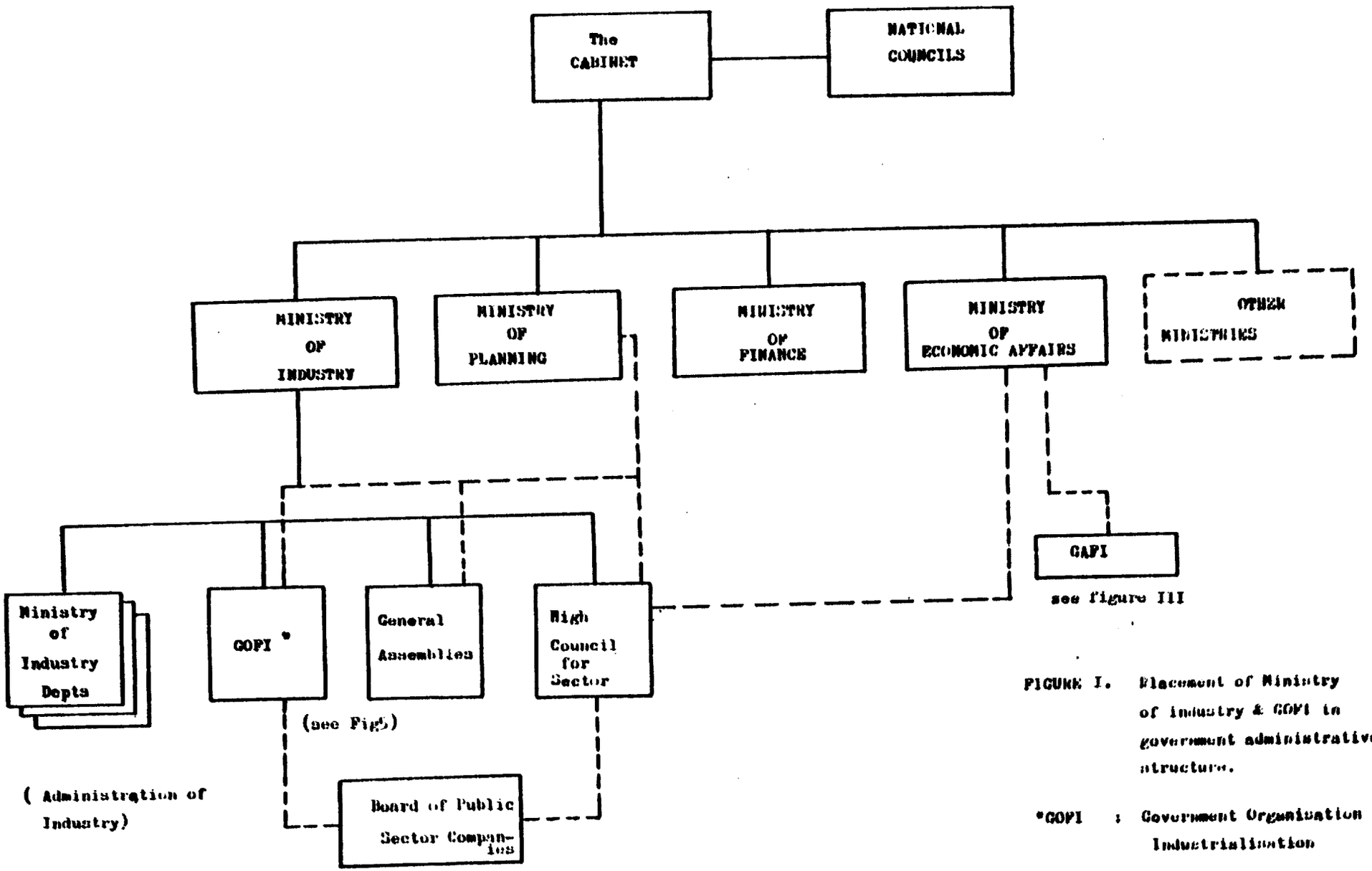

FIGURE I. Placement of Ministry of Industry & GOPI in government administrative structure.

*GOPI : Government Organization for Industrialization

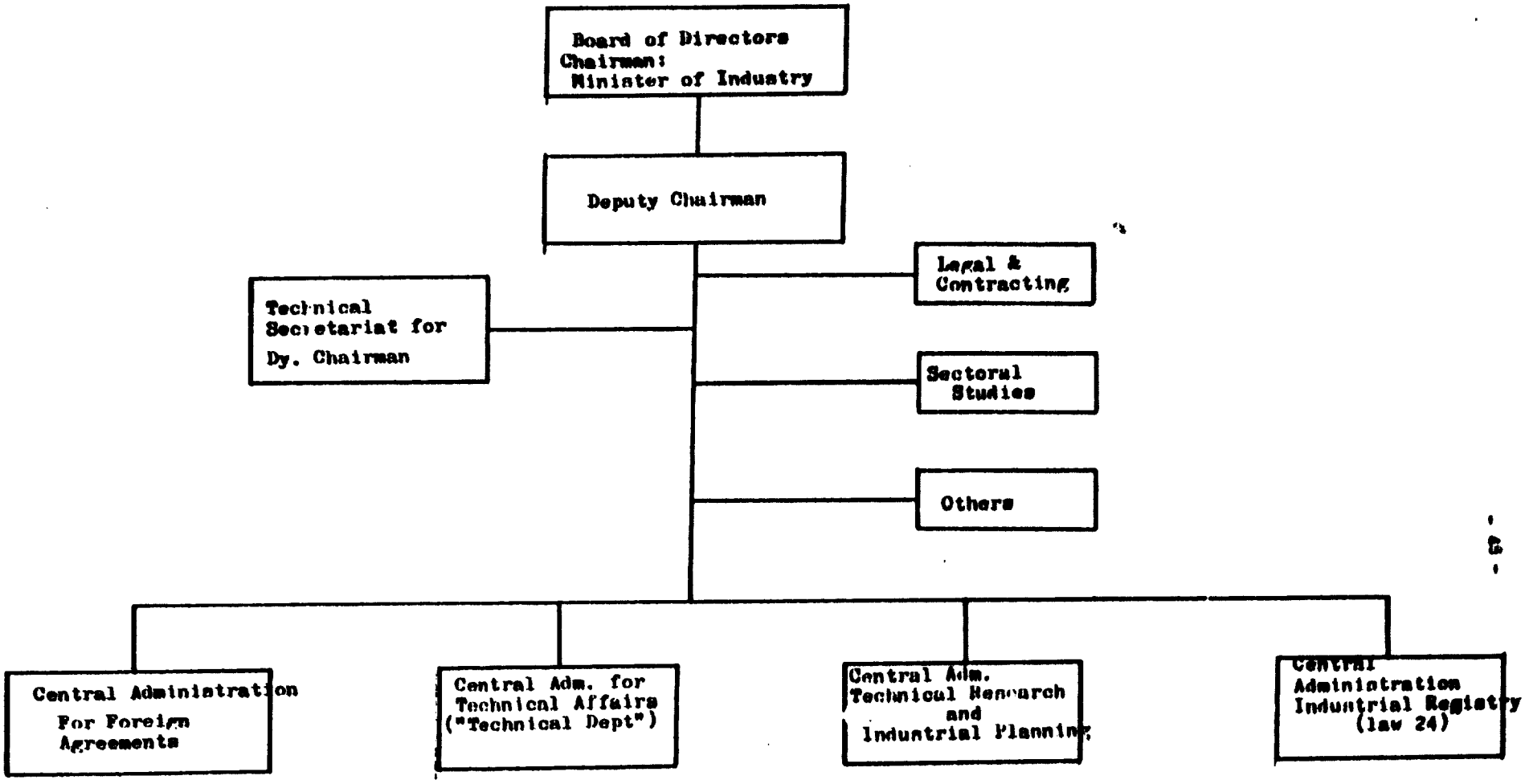

Figure II. Organisation Structure of GOVI

3. Examining the most efficient utilization of new and existing industrial capacities and assistance in solving technical and technological problems.

4. Identification of investment opportunities based on available local and natural resources.

5. Carrying out pre-investment and feasibility studies of industrial projects.

6. Participation in negotiating and concluding agreements on technical and economic co-operation and obtaining external financing for industrial development with international organizations, foreign governments, and private enterprises.

7. Studying applications submitted by Arab and Foreign investors to the General Authority for Arab and Foreign Investment and Free Zones for establishment of industrial joint ventures and giving recommendations as regards the viability of the proposals within Egypt's social and economic targets.

8. Examining applications submitted to the Ministry of Industry for obtaining of Licenses for establishing or expanding national industrial private enterprises. GOFI's recommendations are given in the light of certain consideration of the internal economic situation and the need of local consumption and exports.

9. Participation, with concerned companies, in preparing specifications and general terms of tendering and in the conclusion of contracts for delivery of machinery, equipment, accessories and spares as well as know-how and technical assistance for the establishment. Renewal or expansion of industrial projects to ensure the most favourable contract terms.

10. Follow-up implementation of industrial projects.

11. Promoting local manufacture of machinery and equipment through control of import requests to exclude items for which established local industries can serve the same purpose.

12. Promotion of industrial design in the mechanical, electrical and electronic fields through two specialized centres serving the above activities.

General Authority for Investment and Free Zones (GAFI)

GAFI is an autonomous body with a Board of Directors, whose Chairman is the Minister of Economy and Economic Co-operation (see figure I). It was created as a body with juridical personality by a Decree of the President of the Republic. GOFI is represented on the Board of the Authority.

Law 43 of 1974 (see Section III) defines the authority of GAFI . GAFI is responsible for the approval of all foreign investment in Egypt, the promotion, approval and support of Joint-Ventures and the approval and management of Free Zone Projects (both Public and Private Free Zones). It is also the body which has the authority to approve the statutes of Joint-Venture Companies.

The basic Organization Structure of GAFI is presented in Figure III.

The routine functions of GAFI are:

1. To prepare lists covering the types of activities and projects in which foreign capital is invited to participate in Egypt.
2. To review investment applications.
3. To register incoming capital.
4. To approve remmittances of net profits of companies approved by GAFI.
5. To facilitate procurement of permits necessary for executing projects where foreign investment is involved).

GAFI has a vast scope of responsibility since foreign investment (including Arab investment) in all sectors is controlled by the organization. Industry, banking, investment companies service companies (as insurance), tourism, reclamation of baagen land, etc. would all come within the ambit of GAFI's responsibility.

Academy for Scientific Research and Technology (ASRT)

ASRT is the focal body in Egypt for scientific and technological research. It was constituted by Presidential Decree in 1971. Its President has Ministerial rank and direct access to the President of the Republic, The Academy has a Council, a Council's Bureau, a Technology Secretariat and 16 specialised Research Councils covering 80 research organizations and centres.

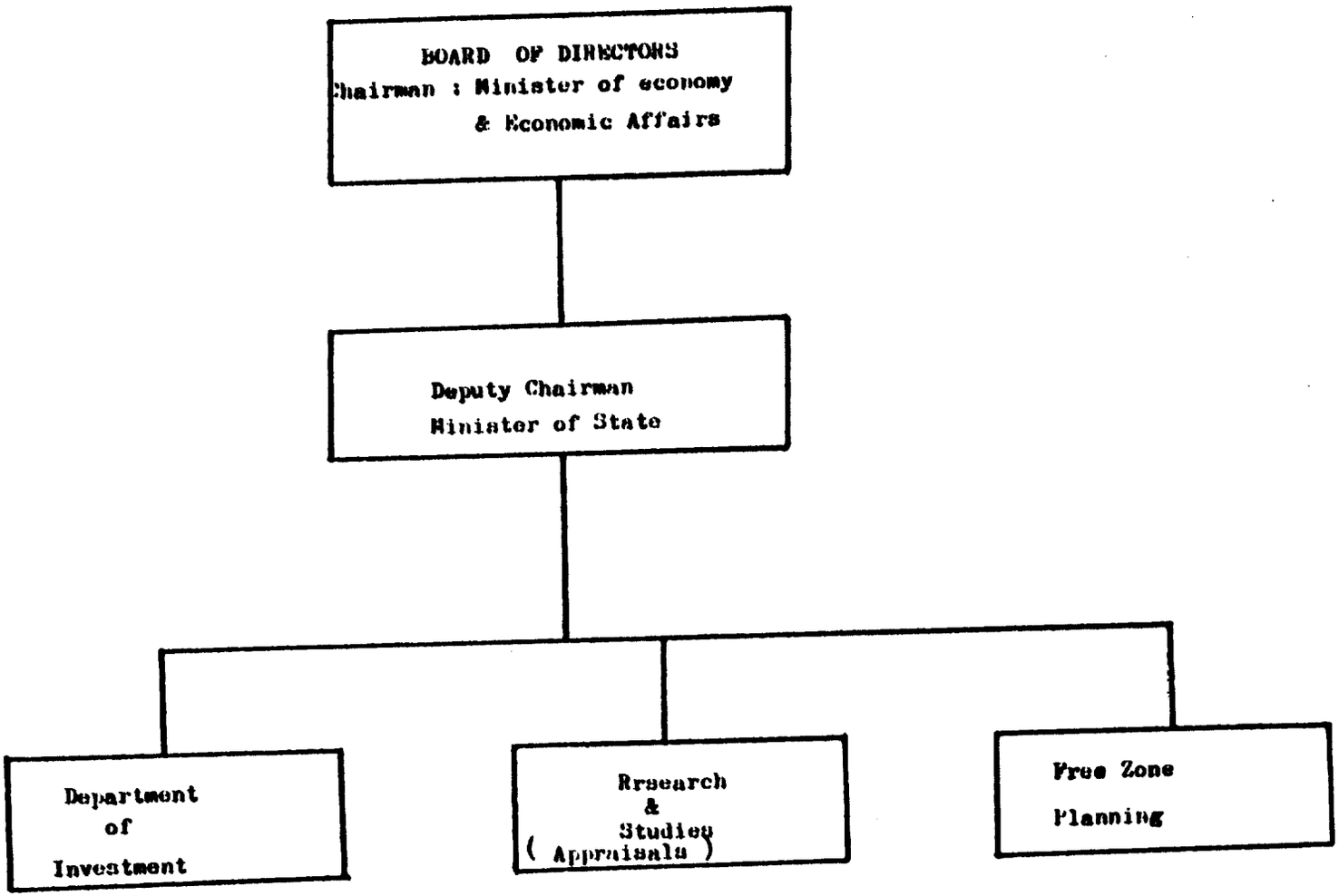

Figure III. Schematic Administrative Structure of GAFI

A number of autonomous science and technology institutions are affiliated to the Academy - as the National Research Council (14 research divisions, 40 laboratories), Agricultural Research Centre (14 institutions), the National Institute of Standards, the Patent Office of Egypt, the Atomic Energy Establishment, the National Information and Documentation Centre, Petroleum Research Institute, Engineering and Industrial Design Development Centre (EIDDC), etc.,

Its priority areas of research are food and agriculture; construction; health and environment and natural resources.

Its basic functions are:

- to support scientific research directed to solution of national problems;
- to encourage application of modern technology to economic and social development;
- to encourage strong linkages at the national level among scientific and technological organizations; and
- to co-ordinate and participate in scientific and technological research and in dessemination of information on modern technologies.

SECTION III: POLICY CONSIDERATIONS

TRANSFER OF TECHNOLOGY ENVIRONMENT

Historical Perspective

In the last 30 years, Egypt has undergone major social and political transformations which have frequently affected its economic and industrial policies and thus its rate and extent of industrialisation. Its present attitude with regard to foreign technology and investment is largely based on the need to restructure its economy so that Egypt can squarely face the needs of its exploding population.

Egypt currently has a deficiency of adequate policies and instruments to carry out its new programmes. The legacies of many past policies and actions are very prominent in the present industrial scene which the Government requires to be reshaped.

In this Report, recommendations are made for new policies so as to orient transfers of technology in directions desired by the Government. These policies, however, must take into account others that have prevailed in the past, their strengths and weaknesses, as well as the impact they have had on economic, social and industrial structures and development. Thus a quick review of this period will be very useful and will provide the background and rationale for the findings of this Report.

The development of Egypt's industry since the Revolution of 1952 can be studied with some perspective and convenience by considering its evolution, or placement, in three time periods:

(1) that between 1952-60 before wide-spread nationalisation of business and industry (2) that between 1960-1971 when the Public Sector became the virtual owner of all industrial and business assets and the prime and sole engine of national economic and industrial growth, and (3) the post 1971 period when foreign investment and modern technology are being promoted, along with private sector development, for rapid planned industrialisation and the transformation of a quasi-agricultural society into an industrial one.

Policies in the Period 1952-1960

Until the political crises that arose around Suez Canal in 1956, the Free Officers of the Revolution concentrated on land reform and left industry to operate under laissez faire forces. Except for military production, virtually all industry and trade were in the private sector, and Egyptian-controlled industries as those of the MISR Group and the 'Abboud empire', co-existed and competed with foreign-controlled companies (largely with French and British interests). Egypt's favourable balance of trade permitted it to operate without foreign exchange controls. Customs tarriff barriers were possibly the only determinants as to what manufacturing activities would be feasible in the country.

Egypt's population was yet to explode and agriculture was able to absorb the labor force. With Egypt being traditionally progressive in social policies as health, education and housing, a low rate of economic and industrial growth was not a menacing factor. Even though, by the mid 50s foreign exchange controls were introduced, industrialisation continued to be tardy.

Law 156/1953, modified by 475/1974, basically set the policy for foreign investment and technology transfer. Foreign investment was welcomed in industry, trade, mining, power, transportation and tourism. However, except in oil, there was meagre response to these laws. National investment was basically directed to agriculture.

The Suez Canal political crisis, and its aftermath, the confiscation of British and French industrial interests, unwittingly transferred to the Government a role in the management of industry. Under the political philosophy of 'Arab Socialism', the foreign units became nucleii for the development of a Public Sector in industry. However, with technical and technological links with the foreign (British and French) investors severed, the function of maintaining the production system was transferred to nationals, most of whom had scant experience in industry management. The country consequently embarked on a very substantial programme of technical education, with large numbers of Egyptians going abroad for training.

A major innovation in industry management was the enactment of Law 21 of 1958 (presently operative in parts). This provided the means for establishing a comprehensive institutional mechanism for the promotion and regulation of private sector industry. An organised Public industrial sector was then yet to be born. The Law required the

formation of a General Organisation for Support of Industry which was invested with specific powers and duties. In its regulatory aspect, the law required all existing industrial units in specified areas of operation, and all new units, to be registered in a Registry formed under the General Organisation, and created an obligation on them to abide by the directives issued by the Organisation during the process of registration. Law 21 authorised the Organisation to only approve those projects - issue Industrial Licenses - for which there was requirement within the socio-economic plans of the State. (The Industrial Register, it is to be noted, was maintained by the Organisation)*.

In its promotional aspect, Law 21 imposed duties on the Support Organisation. It was required to assist applicants in the determinations of project feasibility, equipment and production process, and to provide them with domestic/foreign procurement assistance. The Law further required the organisation to develop and/or support institutional structures as design and industrial consultancy services, R&D laboratories, standards institutes, etc to assist entrepreneurs. With the development of national planning, the function of the 'Support' organisation was changed to that of Execution ('General Organisation for the Execution of the Five Year Industrial Program'). The Organisation again changed its name a little later to become the present General Organisation for Industrialisation (GOFI).

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* Law 24 of 1977 has created a new Industrial Registry with the onus of registration on the <u>producer</u> of goods (investment exceeding L.E. 5000).

Policies in the Period 1960-1971

National Plans were inadequately implemented prior to 1960. Revenues from the nationalisation of the Suez Canal, exports of cotton, tourism, etc and from domestic industry were inadequate to finance large industrial ventures since agricultural projects, as the High Aswan Dam, placed major demands on resources. The Egyptian private sector, or foreign investors, were not forthcoming enough to take the place of public sector investment. This paved the way for the Government to nationalise banks, insurance companies, large trading houses and practically all industrial units, foreign and domestic.

The 60s saw the emergence of a giant Public Sector both in trade and industry. Industrial production was either in very small units (furniture, leather, wearing apparel, etc) or in the Government Sector. National Plans acquired greater meaning. Where foreign financing was required, Egypt's policy was to accept unconditional foreign aid or unconditional foreign loans. Technological reliance began to shift to USSR and countries of the Eastern Bloc. Simultaneously, industry began to depend on local institutions for technical assistance. A comprehensive technical-research infrastructure began to take shape.

However, progress was uneven in the 1960-1971 period. The 1967 war saw the destruction of substantial property, including industrial facilities. Military needs usurped the resources needed by industry. While industrial capability grew (the human infrastructure) assets growth was stemmed.

Laws 156 and 475 continued to be in force during the period but meagre foreign investment was forthcoming. After the 1967 War, the Government liberalised its attitude to the private sector. Law 21 (of 1958) which was conceived on a promotional bias, but which was administered on a discrimminatory * basis in the 60s to favour the diversion of resources to the Public Sector, reverted to its initial bias. A new Law 32 (of 1966) was introduced to enlarge scope for joint-ventures but it was administered to the advantage of the Public Sector. Even so, it only drew foreign investment in pharmaceuticals and petroleum.

Policies in Post-1971 Period

The entire national and industrial scene has undergone a 'sea change' since 1971. In September 1971, Egypt adopted a new Constitution. Articles 28, 34, 35 and 36 recognised that the State will provide protection to private property. The Constitution provided safeguards against sequestration, nationalisation and confiscation of assets. The Supreme Constitution Court was formed to judge constitutionality of laws and regulations.

The 'First foreign investment law', Law 65/1971, concerning investments of Arab funds was enacted, while earlier laws defining 'foreign investment', in general, remained on the statutes. This Law foreshadowed Law 43 of 1974. A "General Authority for Investment of Arab Funds and Free Zones" was created. The law permitted, on a somewhat

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* Industrial activities in the Private Sector" GOFI Report, August 1978 (Prepared by Deputy Chairman's Technical Office)

restricted basis, the repatriation of capital but provided guarantees against sequestration, nationalisation and expropriation except through judical processes.

In 1973 the Government recognised and institutionalised the 'parallel foreign exchange market' (Decree 422 of 1973) so that Egyptians living abroad could freely utilise their large foreign funds for the creation of Egyptian assets. This has now become a major channel for private sector trade and industry.

1973 also saw the presentation of the 'October Paper' which ennunciated Egypt's plans to provide liberal means for the participation of Arab and Foreign Capital in Egypt's economic development. A national Referendum (May 15, 1974) endorsed the Government's plan for aggressive industrialisation. New Law 43 of 1974 extended the safeguards and guarantees of Law 65/1971 to all foreign capital, and furthermore, provided additional incentives.

Egypt's Open Door Policy (October Paper) announced the following objectives:

a) acceleration of economic growth

b) decentralisation of decision-making in state-owned enterprises

c) Liberalisation of private sector activity in technology and investment

d) creation of infrastructure to absorb the thrusts of economic development.

e) incentives to stimulate foreign and local investment

f) reshaping of Government's own investment policies.

Law 43 of 1974. For a defined set of projects, considered contributive in terms of the nation's socio-economic interests and national plans, the Law facilitates free inflow of foreign and Arab capital (including those of Egyptians domiciled abroad) conferring on it substantial priviliges, guarantees and exemptions. Foreign capital is allowed to participate in 'inland' and 'Free Zone' projects; such participation, in general, being associated with Public or Private Sectors in which there is some Egyptian capital. However, 100% ownership of capital in foreign hands is feasible if in public interest. Foreign "investment" may be in terms of currency, machinery and equipment, materials, and reinvested profits. Intangible assets such as patents and trademarks, held by residents abroad, together with free foreign exchange spent in "preliminary studies", can be capitalised and form part of invested capital. The Law also permits a foreign company to purchase, with foreign currency, stock in an existing Egyptian company. 'Special Priority' is given to projects which will increase exports, encourage tourism, reduce import of basic commodities and to projects "which require advanced technical expertise or which make use of patents and trademarks of world wide reputation".

Priviliges accorded to 'inland' joint-venture projects are liberal imports of machinery, equipment, materials and spares without import license (but on condition of inspection), freedom from Government scrutiny of tenders and tender selection (otherwise required by law), tax-holiday on profits etc.

Joint-ventures with public companies are treated as projects in the private sector, without having to subscribe to formalities otherwise applicable to public sector projects. Law 32 of 1977 amended Law 43 so as to liberalise it further and provide greater incentive to foreign capital. Importantly: (a) customs duties on capital equipment imports could be exempted by the 'authority of the Board' (GAFI) (b) certain provisions of Law 43 were extended to Egyptian nationals and Egyptian capital when associated with foreign capital, and (c) arbitration was extended to cover a larger ambit of potential conflict.

Other laws have followed to enhance the role of the Egyptian private sector and give to it incentives. Important among them are laws 86/1974, 137/1974 and 118/1975. Broadly these laws allow the private sector to import its requirements of raw materials, facilitate the associated importation procedures, and exempt the enterprises established within the frame of national industrial development plans, from taxation*.

In order to provide an information base, Law 24 of 1977 was enacted. This requires all firms, including joint-ventures, which are engaged in industry, to voluntarily register themselves with the Industrial Registry. Failure to register deprives the firms from any form of Governmental assistance.

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* Largely the laws are in the context of the 'parallel foreign exchange market'.

Summary Review of the 1980 Environment for Technology Transfer

Administrative mechanisms to de-centralise decision-making in Public Sector companies, the creation of a 'sole competent authority' for joint-venture projects, new incentives and greater safeguards provided in amending Law 32 for foreign investment, the 'facilitating laws' for private enterprise, and the 'parallel' foreign-exchange mechanism, all strengthened by the Peace Treaty with Israel, have combined to give great dynamism to Egyptian trade and industry.

The resources position of Egypt is steadily improving Revenues from the Suez Canal Authority, tourism, exports of petroleum, cotton and textiles, and repatriation of capital by overseas Egyptians, are growing at a substantial rate, buttstressed by U.S. AID, loans from World Bank, IMF and EEC. These have also offset declines in aid otherwise flowing from the oil-rich Arab States.

Very significant efforts are also being made to improve the industrial infrastructure, and it is fortunate that the country is now a net exporter of petroleum fuel. However, Egypt has to rely quite heavily on imports for capital goods.

On the debit side, there is great need for reconstruction of factories which were damaged in the Wars of 1967 and 1973, and the rehabilitation of plants, mostly in the Public Sector, which are employing antiquated machinery and technology. There is also demonstrated need for the development of an organic and petro-chemicals country which is virtually non-existent. Egypt, while a substantial producer of steel, cement, aluminium etc. cannot meet its local requirements and has to resort to imports to meet its large deficiencies.

Egypt's manufacturing industries are not sufficiently back-integrated. And the tariffs situation is such that there is little incentive for it to take place. Therefore, substantial parts of its automotive and consumer durables industries are essentially assembly operations, with very low value-addition. Liberal grants of import licenses for joint-venture projects, combined with the imports made through the parallel foreign exchange market, have also induced a situation whereby large idle capacity is created in otherwise viable facilities. Again, for many of the factors enlisted above, the large number of Government research laboratories, design institutes, etc. are unable to make their contribution to industrial development.

While Egypt has a large population, and its people have demonstrated an aptitude to technical education and technical/technological proficiency, there has been a 'brain drain'. Nearly two million skilled Egyptians are living outside in country, very largely in the oil-rich Arab States. This has caused a very significant shortage of skilled personnel for Egyptian industry. Furthermore, the Public Sector- where the bulk of industry is situated - is unable to draw upon existing skills because working conditions, scope for advancement and salary levels in competing private sector joint-venture projects are far more attractive.

Largely for the historical reasons cited, Egypt has a deficiency of adequate policy instruments to carry out its large programmes. It is well recognised, for example, that because

of inadequate linkages, co-ordination between the Ministries is poor. Similarly, because of the absence of institutional mechanisms, its information system is underdeveloped - which leads to conflicting assessments of the economic situation and its performance. There is no data base on industry which can be used for market studies. Likewise, in the area of transfer of technology and foreign investment, there are only informal systems of information registration. For illustration, available data is so scanty that it is not possible to even roughly assess what impact present flows of technology and investment are having on the industrialisation of the country or on its balance of payments.

Qualitatively, however, the overall net position of the industry and economy must be viewed as optimistic. In terms of technology transfer, a viable situation exists. There are no entrenched pressure groups. Transnational corporations, while they are beginning to enter industry in a large way, do not now have a local 'presence' or lobbying power. Similarly, there are no foreign enclaves (in real estate, plantations etc), and therefore, vested expatriate interests. Equally, there are no concentrations of economic power in private sector industry, there being very few large private firms. There is also conspicuous absence of labour problems in the form of trade union agitation. And finally, all key national resources, as petroleum or minerals, are wholly in the hands of Government, outside of power blocs as the Arab oil cartel or the TNCs.

A broad implication of the above described environment is this: if Egypt can devise forthwith comprehensive policy instruments for the proper channelling of foreign technology and investment,

and if political will is present to utilise the instruments, the country may be able to pursue its socio-economic objectives without having to pass through those phases, encountered by other developing countries, where entrenched foreign and domestic monopolistic and oligopolistic systems have to be first dismantled or moderated before balanced economic development or social justice can be attempted.

For its plans of balanced industrial development, Egypt's policy instruments have, indeed, to create two entire sectors of industrial activity: (a) a large-units' private sector of free-standing Egyptian-controlled enterprises which can exist independent of foreign investment or Government's subsidies* and (b) a small-units' private-sector, using techniques of modern industry (see section V), supporting, interlinking and drawing strength from industry and agriculture.

One of the strange anomalies of Egypt's new policies is that direct transfers of technology, unaccompanied by investment, have neither adequate channels for entry into the country- institutional mechanisms - nor is there a clear policy as (as Law 43) to attract and employ them. This is a glaring lacuna which needs to be urgently redressed. It is to be noted that one of the major problems that developing countries as India, Mexico, Argentina and the Republic of Korea - have faced, in fact, is to 'unpackage' transfers of technology so that technology can

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* Thus reverting, for example, to the independence of the MISR Group of enterprises in the pre-1960s.

flow in divested from investment. Without a parallel incentive mechanism for direct transfers of technology, Law 43 would indeed in the anomalous position of having institutionalised 'packaging'!

On the other hand, the joint-venture instrument appears to be administered without emphasis being placed on a desired form of 'packaging' (in the context of Egypt)- that is, the accompaniment of managerial systems and methodology. This lacuna again needs to be remedied.

REVIEW OF CURRENT SYSTEMS OF PROJECT/TECHNOLOGY/LICENSE APPRAISAL AND APPROVAL

Egypt has adopted a decentralised system for the approval of industrial manufacturing projects. Approval authority is distributed among several Ministries and autonomous organizations. Each manufacturing unit must obtain the approval of the authority which has jurisdiction over the proposed field of activity.

While the Ministry of Industry is the most predominant organisation for the supervision of industrial activity, it shares the overall responsibility with Ministries of Health, Housing, Military Production, Agriculture, Petroleum etc and with the General Authority for Investment and Free Zones (GAFI)

In this Report, frequent reference is made to the roles of GAFI and GOFI in project approvals. As stated earlier, both are autonomous bodies with separate Boards of Directors, Chairmen and Deputy Chairmen. They each have a juridical personality and are created by a Decree of the President of the Republic. The Board of GAFI is under the Chairmanship of the Minister of Economy and Economic Co-operation. That of GOFI is with the Chairman of the Ministry of Industry and Mineral Wealth. In terms of project approvals, GAFI is the "prevailing authority" in respect of joint-ventures, Free Zone projects and foreign investment. GOFI, on the other hand, is essentially an advisory body in respect of project approvals to which the Ministry of Industry has delegated executive authority in some specific areas.

The appraisal and approval of industrial projects take a complex shape in Egypt as it has adopted, on the one hand, a decentralised system for approvals, and on the other, a multi-agency system for appraisal. At the same time, there are also certain sharp differentiations in the methodology applied to three sectors of industrial activity: (1) the Egyptian Private Sector (2) the Joint Venture Sector (with public or private capital) and (3) the Public Sector. Further, approval authority in each of these sectors is either controlled by separate laws or by a legal administration procedure derived from sets of law.

To give perspective to project licensing, and to avoid detraction from detail, the following classification is first provided:

Private Sector Projects

Private sector manufacturing projects, with wholly Egyptian capital, are controlled by Law 21 of 1958 where the total investment in a project exceeds LE. 8000. Each private sector unit must obtain the approval of the Ministry which responds to (has the jurisdiction over) the proposed field of manufacture. Thus, the Ministry of Industry would have jurisdiction if the proposed product was an engineering item, the Ministry of Health if a pharmaceutical, or the Ministry of Agriculture if pesticide.

Approval is accorded in the form of an Industrial License. This would stipulate the location of the plant, its ownership, product to be made, its specifications, manufacturing capacity, etc.

Law 21 requires formalised appraisal of a proposed manufacturing activity for testing its economic and technical soundness. This is done by assessing market estimates, machinery, production-system proposed to be employed, etc. The object of the Law is to ensure that the candidate project has socio-economic relevance and placement in National Plan.

The approval authority need not always to be the body that appraises the project. Certain Ministries as Health, Agriculture, Petroleum, etc. may exercise both functions. But in a large number of cases, Ministries will send a proposed project to GOFI for appraisal.

A detailed schematic of the appraisal/approval procedure is presented in Figure IV.

Joint-Venture Projects

Law 43 of 1974 governs the approval of projects in the joint venture sector, irrespective of its nature - industry, land reclamation, tourism, etc. Law 43 applies to both private and public sector firms. The question of the percentage of foreign investment that will make a project 'a joint-venture' is not defined in the Law. (In the Egyptian system, 100% foreign owned manufacturing enterprise will be an exception).

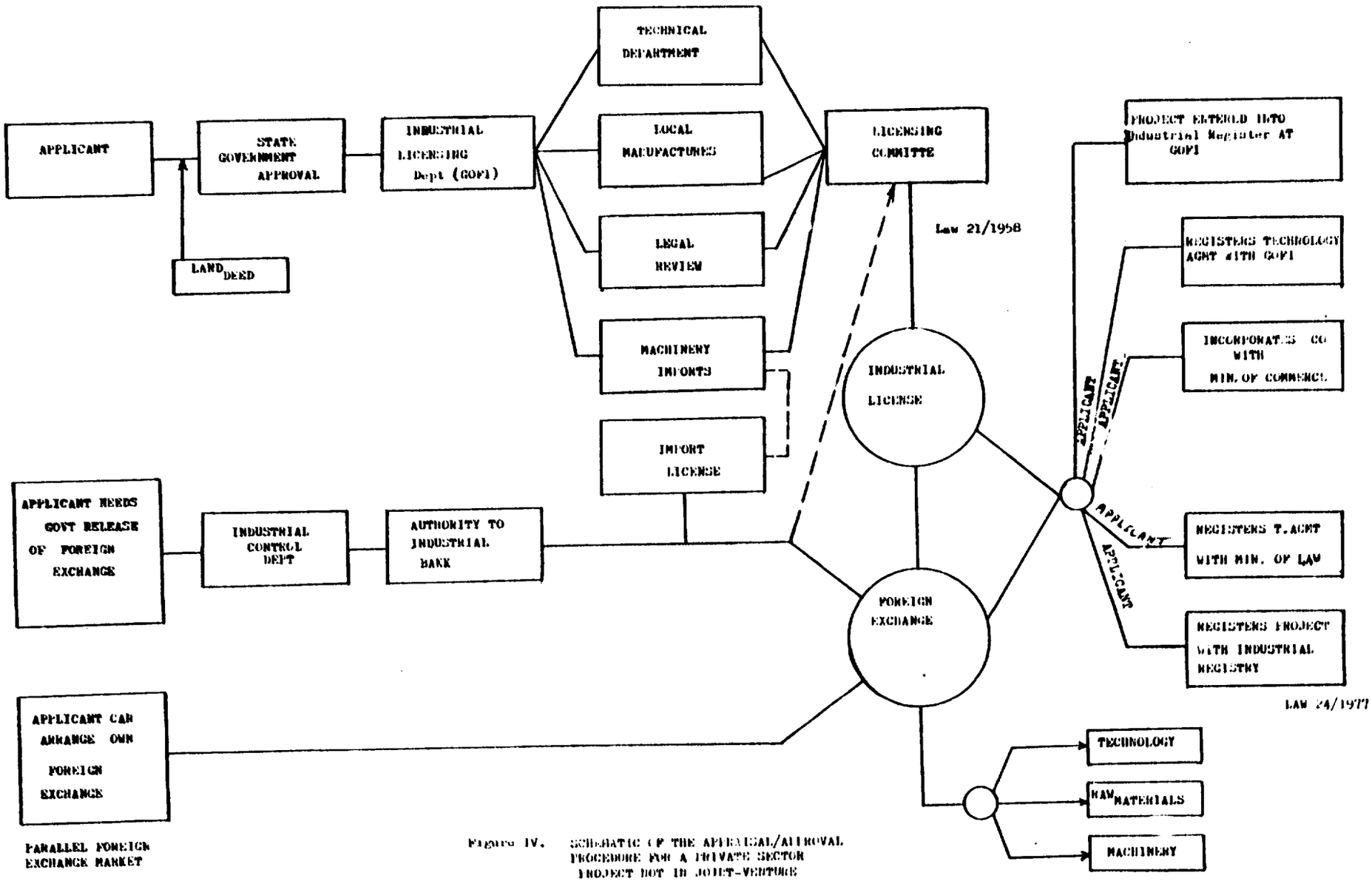


Figure IV. SCHEMATIC OF THE APPRAISAL/APPROVAL PROCEDURE FOR A PRIVATE SECTOR PROJECT NOT IN JOINT-VENTURE

The approval body for all joint-ventures is GAFI. Departments of GAFI appraise the project in terms of the financial contributions of the partners, the distribution of management powers, project location, articles of incorporation, its 'priority status' etc.

The appraisal of the technical and economic soundness of the project is usually done by the evaluatory departments of Ministries who have the necessary expertise. Thus, a textile project will come to GOFI for appraisal while that for a drug will go to the Ministry of Health. While GAFI will weigh such appraisals, its decision power is binding. However, under the charter given to GAFI, under Law 43, project approvals have to be tested 'for the purpose of realising the objectives of economic and social development ..... and national plan .....'. Thus GOFI, and the Ministries are indirectly involved in final endorsement.

A detailed schematic of the applicable appraisal/approval procedure is presented in Figure V.

Public Sector Projects

Whereas Law 43 places the responsibility for approvals of all joint venture projects on GAFI, and Law 21 on responding Ministries, for all private sector projects, there is no dominant law controlling the approval of public sector projects. Presently, these projects are conceptualised, investigated and formulated at various points (GOFI, existing Public Sector Companies, Ministries, etc), and on endorsement by the 'High Council for the Sector' and 'General Assembly' (situate in

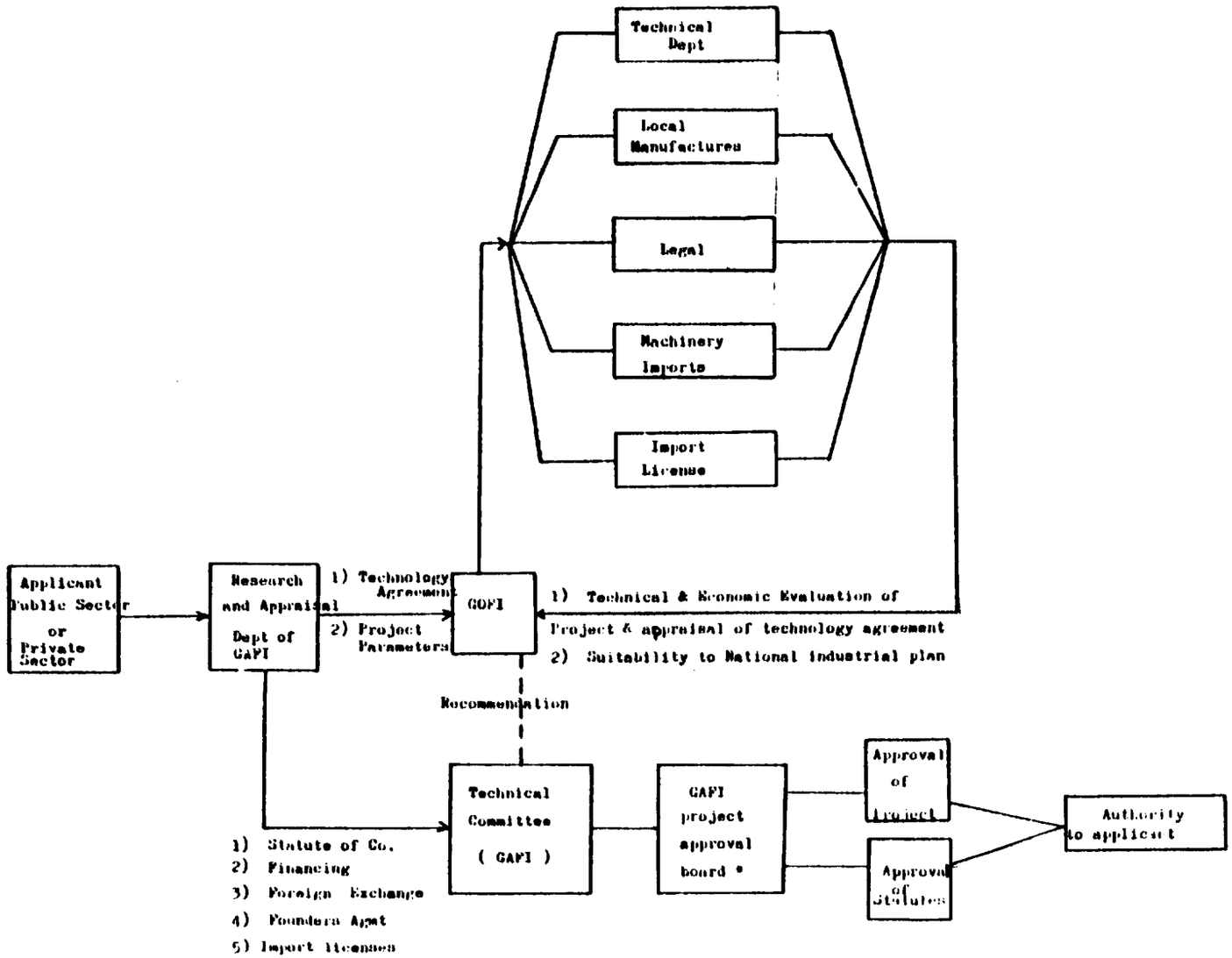


Figure V. Schematic of appraisal approval procedure for joint- venture industrial project (law 43 of 1974) in private sector (for products where GOFI has responsibility)

* GOFI is represented

each Ministry) incorporated into National Industrial Development Plan after consultation with the Ministries of Finance and Planning. Incorporation into the Plan constitutes approval. Projects in new Public Sector Companies, where so proposed and endorsed, become established when a Decree by the President of the Republic creates the new company.

The question of appraising Public Sector Projects (which are not in joint venture) does not arise since they are formulated in terms of Egyptian capital and national necessity. Highly qualified personnel of both the sponsoring group and the Ministries (where these are separate) participate in the technical and economic analyses of the project, thus making formulation an appraisal in itself.

Since Public Sector units dominate the industrial economy of Egypt it may be reasonable to dwell a little on the project formulation exercise. Most often operating companies themselves are sponsors of new projects, either in terms of product-mix diversification, addition of new product, modernisation of plant, or its rehabilitation. Where the cost (investment) is below L.E. 750,000, the operating companies can themselves 'appraise' the project, obtaining sanctions of funds from the responding Ministries. Or they can seek the assistance of the Technical Department of GOFI. Where the investment exceeds L.E. 750,000, the role of GOFI enlarges. Project viability must be vetted and endorsed by GOFI. Most often, for these large projects, both GOFI and the candidate enterprise will work together on project presentation.

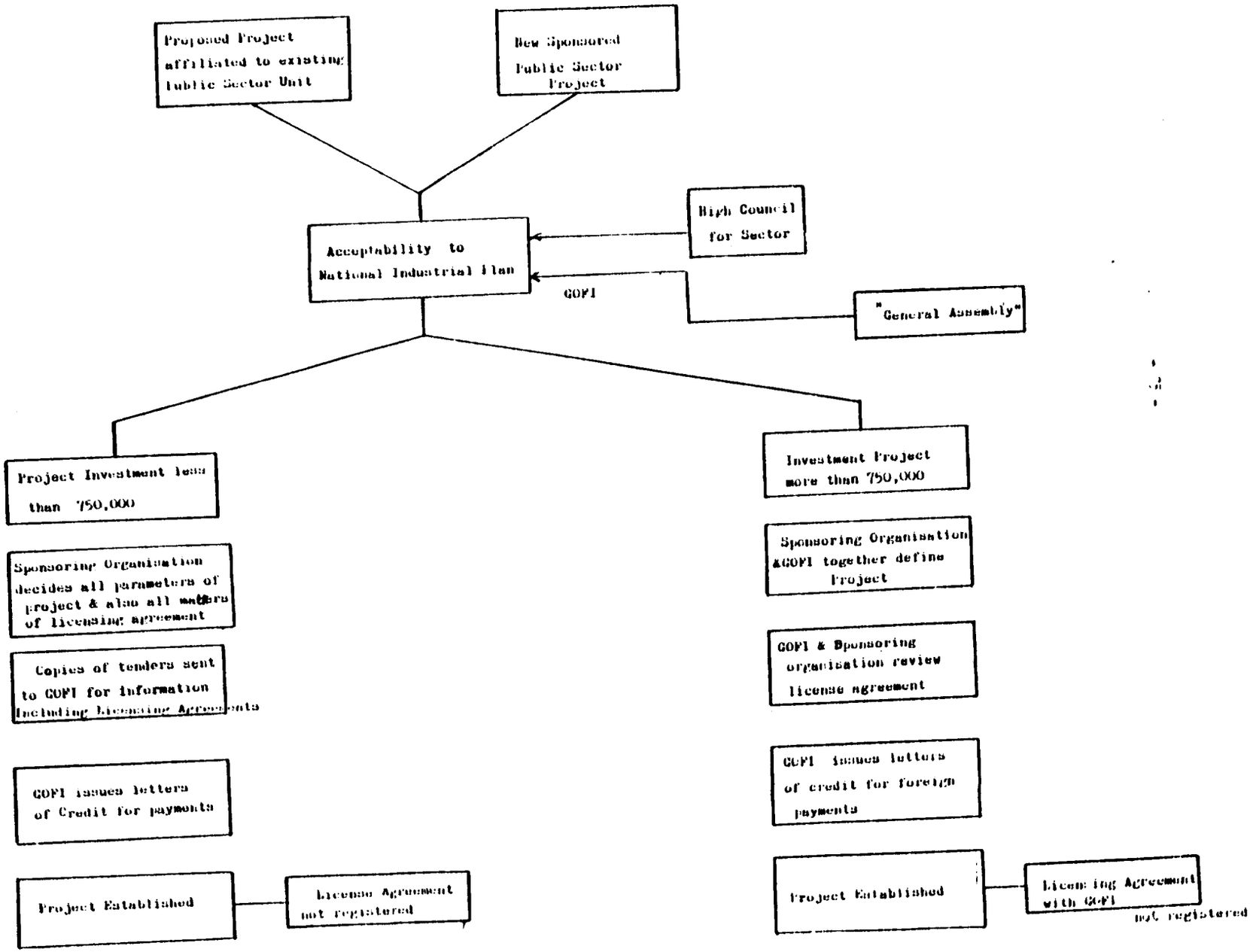
A schematic of the appraisal/approval procedure is presented in Figure VI.

Screening of 'Technology' and corresponding Licence Agreements

Thus far, for reasons of giving clarity to this approval-appraisal system, facets relating to technology suitability, the use of foreign technology, and appraisals/approvals of foreign licensing contracts, has been held in abeyance. The discussion on these can now follow:

To the extent that the Consultant was exposed to Egyptian industry, the assessment is made that most of the technology the country is currently employing is technology of the 1960's, most of it machine-embodied and practically none from the multinationals. Suppliers of equipment and machines, in effect, have also been the suppliers of 'technology.' Machines, foreign technician-assistance, and overseas training of plant personnel have constituted the bulk of technology transfer elements. That is, there has been very little of patented or secret technology in use, or even trademarks, over which the typical obligations of a licence would prevail. This leads to the further assessment that appraisal of the license agreement has not been as dominant, or as important, a criterion in Egypt as machinery appraisal, its import considerations, and arrangements for training programmes. Government-to-Government technical co-operation programmes, in the predominant Public Sector, and furthermore, with the Eastern Bloc, also account for the passive acceptance of technology terms.

Figure VI.
Schematic of appraisal/ approval process for public sector projects with a Ministry of industry control.



However, under the 'Open Door Policy' and the current hard push for industrialisation, considerable modern technology, and from transnationals, is coming into Egypt; as also patented and brand-name products. Thus, the need for appraising technology, in itself, and as reflected in the licensing agreement, is becoming important and urgent. There is also growing awareness that the supplier of technology can be different from that of the supplier of machinery/equipment, and hence, independently negotiable.

Technology appraisal is presently a review of the 'shopping list' of an applicant firm. Appraisal involves examination of the need for each item of the shopping list, its relationship to other items of the list, the examination of import needs, the analysis or review of the specifications of proposed raw materials and of machinery/equipment and products, etc. To date, this has been feasible because secret process knowledge is not the major constituent of most manufacturing proposals. Also, the supplier of the equipment or technology has generally not hesitated to furnish the full shopping list since many industrial projects are assembly operations or constitute processes of well-practiced art.

With the large current influx of modern technology, Egypt would have to pay considerable attention both to alternative technologies and to alternate suppliers of the elected form of technology. Thus, for example, it would have to first assess the merits and demerits of making steel via the blast-

furnace or 'direct-reduction' routes, and if the latter is elected, to appraise the best source for the technology (competing licensors). After such evaluation, Egypt will be able to take decisions on where it could procure the equipment.

In summary, it would appear that the technology appraisal procedure in Egypt has many weaknesses which need to be remedied.

In respect of licensing agreements, there is no specific law or legal provision in the Egyptian system that requires the registration of agreements. Equally, there is no express provision in law for the evaluation of agreements to test their acceptability in the national framework. Neither at the National level nor at the Ministry level is there specific or general documentation of approved or negotiated licensing contracts.

However, in testing a manufacturing proposal for the issue of the Industrial License (under Law 21), there is casual review of the agreements accompanying the candidate firms application. In most cases such agreements would also cover purchases of machinery from abroad. Often, the cost of technology would be included in the cost of machinery.

In calender year 1977, it is reported* that some 800 projects were approved in the local private industrial sector.

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* UNCTAD Report, Academy of Scientific Research and Technology, Ewing & Hassan Nov. 1978.

Of these only 5 involved technology license agreements with foreign companies.

In calender year 1979, it is estimated by GOFI that it 'reviewed' 96 agreements in the process of approving about 800 projects. Of these 87 were for the sole purchase of machinery, 8 for the combined purchase of machinery and technology, and one alone involved a straight-forward licensing agreement for foreign technology. No data were made available to the Consultant on agreements reviewed by Ministries as Health, Petroleum, etc. or those reviewed by GAFI. In general discussions with GAFI it was ascertained that no specific appraisals of technology licensing agreements were made by them, the greater attention being paid to investment agreements and 'articles of incorporation' of companies (which are its major responsibilities).

Registration of Manufacturing Projects

A private sector firm in Egypt, with wholly Egyptian capital, or a joint-venture firm with foreign capital, will have to register many of its activities with many bodies. The following is a listing of the registrations that are now in effect. These are provided so as to prevent them from being associated with the term 'Registry' as conventionally used in connection with Governmental approvals of technology agreements in other developing countries.

1. Registration of firm in the Governorate in which it would have its manufacturing activities.

2. Registration with Industrial Registry under Law 24 of 1977. This registration (now getting undersay) serves, basically, a statistical purpose. (Failure to register deprives a firm of several Governmental facilities as raw material allocation, custom's licenses, etc). The Registration procedure requires the firm to voluntarily disclose its ownership, location, manufacturing capacity, product-mix, foreign collaboration, foreign payments for technology, etc.

3. Registration in the process of obtaining an Industrial License under Law 21.

4. Registration of the Company (its incorporation) with the Ministry of Commerce.

5. Registration of machinery and/or technology agreements with the Ministry of Law (attestation of parties to the contract, date of agreement execution, etc.).

6. Registration of technology agreement with GAFI if foreign exchange is paid for technology.

Of these registrations only item (5) is optional.

It is evident from the above, that several technology-related matters, and agreements thereto are being registered, at one point or another, in the Governmental system. Theoretically, it should be possible to convert one of the registration offices into a statistical office, for the registration of agreements, technology payments, etc.

During the current Mission it was not possible to determine how payments of technology fees (royalty, lumpsum, etc) were being handled or channelled in Egypt or what records were maintained by central banks on remmittances so made. This lacuna will have to be filled in a subsequent mission.

The Roles of the 'Technical' and 'Local Manufactures' Departments of GOFI in project appraisals

It probably would not be incorrect to state that GOFI would typically appraise about 60-70% of all industrial investment in the country. Appraisals would be done not only for the projects of the Ministry of Industry but, as said earlier, also for those administered by GAFI and several Ministries.

Techno-economic appraisals of submitted projects are carried out by the Technical Department of GOFI which has several hundred engineers. The industries covered by the Technical Department given in figure II.

The appraisals are carried out in the context of an information system comprising of sectoral studies, pre-feasibility studies, National Plan estimates and the like. In some cases, the appraisals would be for establishing projects in the Public Sector in other cases, they may be reviews in the context of Laws 21 or 43. Emphasis is largely on economic viability and adequacy/sufficiency of machinery, raw materials, import content, etc.

An acknowledged weakness in the work of the Technical Department, as pointed out in Paragraphs 2.19 and 2.20 concerns appraisals of the technology to be applied in production systems. There are also some deficiencies in the information system. This, however, is being remedied with the help of UNIDO in a separate programme.

The major function of the 'Local Manufactures' Department is to maximise the use of local manufacturing facilities/components (tools, dies, etc) and local services for erection, fabrication, etc. This Department services all industries that come within the Ministry of Industry's purview and all industrial projects in the Authority of GAFI. The Department has no responsibility for the projects of the Ministries of Health, Agriculture, Petroleum and Military Production. But it helps other Ministries as Housing, etc.

For projects that come within GAFI's administration, the Department acts merely as an advisory body. However, for all projects within the Ministry of Industry's ambit, the approval of the Department is obligatory.

This approval is exercised by endorsing proforma invoices of applicants so that customs clearance can be effected. Effectively, the Department exercises import control. Permissibility of import, however, is not merely determined by available local capacity or capability. Time of delivery, specifications that can be met, pricing etc are also considered.

The Licensing Department and the Industrial Licence

The Licensing Department is a part of the GCFI administrative system. The Department is principally concerned with approvals of projects in the private sector established with Egyptian capital. It participates as a component of the decision-complex which issues the Industrial Licence. (See Figure IV).

The applicant for an Industrial Licence would have already obtained location approval from the Governorate in which he would be establishing his plant. And he would have also purchased (or leased) the necessary land, which as a land (or lease) deed he would present to the Licensing Department.

The applicant will also fill out a proforma questionnaire (application form) which will indicate in brief his feasibility study, raw material requirement and sources, machinery requirements, import needs, financing scheme, product-mix and production, and source of technology (know-how), if any.

The Licensing Department then routes the application to the concerned cell of the Technical Department and to the 'Local Manufacturers' Department. Often, in endorsing a project, the Technical Department may set conditions under which the project must be implemented - for example: effluent control, product to meet national standards, specific materials to be used (if, say, product was a cooking vessel), etc. Likewise, the 'Local Manufacturers' Department may set conditions.

. The comments of all screening bodies are then discussed at a Licensing Committee which finally authorises the issue of the Industrial License. This Committee, chaired by a Senior Director of the Technical Department, is comprised of representatives from:

- the Ministries of Economy, Standardisation and Statistics,
- Industrial Federation (a Government-industry group),
- Industrial Banks,

and representatives of the Ministry of Industry as:

- Industrial Control Department
- Legal Department
- Technical Department (concerned cell)

and, of course, the Licensing Department.

Details of GAFI's Review Procedures

The focus in this discussion is only on industrial joint-ventures reviewed by GAFI* (See Figure V).

GAFI relies on specialised Ministries (as Health, Agriculture GOFI, non-Government organisations (UNIDO, Universities, Government and non-Government consultants etc. for the particular and general appraisal of the projects submitted to it.

Public Sector Projects: These projects are specifically built into National Industrial Plans, thus indicating both their economic need and the Ministry that will have the responsibility for implementing them. A project, in

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* Free Zone projects are not discussed in this Report, partly according to the 'terms of reference' of this Mission, and partly on the reasoning that industrial development of Egypt is generally not affected by decisions made in the FZ Sector.

terms of its technical and economic viability, would have already been appraised by the relevant 'High Councils for Sector' and 'General Assembly' before the sponsoring Ministry submits it to GAFI for approval.

The role of GAFI, in the appraisal process, would consequently relate to the examination of the capital structuring of the project, the equity to be contributed by the foreign joint-venture partner, general equity from the public, the debt/equity ratios in the project, raising of debt, the statutes of incorporation, management rights in the administration of the Company, etc. together with the appraisal of the contractual agreements between the parties to the joint-venture. All of these particulars would generally be furnished to GAFI in the form of structured proformas. GAFI would also examine the free currency imputs of the foreign venture partner, the reasonability in the capitalisations of knowhow, intellectual property (patents, trademarks), machinery and technical services (which are to be furnished by the overseas partner), the profitability of the enterprise, etc <u>together with considerations as to whether the project is oriented to exports or to import-substitution.</u>

The 'Research and Studies' wing of GAFI has the responsibility to appraise all of the latter matter and to submit its recommendations to the 'Technical Committee' of GAFI. Final approval is given by the 'Project Approval Board' after the project has the endorsement of the Technical Committee.

Private-Sector Projects: Unlike Public Sector projects, those of the Private Sector would not have been pre-appraised by any Governmental organisation. Therefore, before GAFI takes on the task of appraising capital structuration, etc it would submit the project (in the above-mentioned format proformas) to the Ministry or Organisation having specialisation in the proposed field of industrial activity. This latter group would appraise the project in terms of its national economic relevance and its techno-economic feasibility and furnish its review to GAFI. It would then be wholly within GAFI's responsibility to accept, reject or modify the review of the appraisal body. In figure V, the indicated procedure is when the field of review expertise is with GOFI.

Licensing Agreements: At the present time, no special attention is paid by GAFI to the technology licensing agreement or to contracts pertaining to technology-related services. Such agreements are, however, submitted to appraisal bodies as GOFI, inviting their review. Even so, there is no critical appraisal. For large and complex projects, GAFI has often sought the advise of UNIDO. In about 50% of cases, license agreements are endorsed AFTER the Project Approval Board has approved the project!

Discussions with GAFI officials has indicated that average 'national capital' (equity) in joint-venture projects, with

either the Public or the Private Sector, is about 25%. It has also been revealed that GOFI has so far approved about 170 joint-ventures in the Public Sector (all fields) and that the total of all joint-ventures approved, in all fields, is about 1000 including Free Zone enterprises.

REVIEW OF EFFORTS TO SET UP REGULATORY OFFICES FOR TECHNOLOGY TRANSFER IN EGYPT

Since 1975 there has been growing consciousness in Egypt that the country needs to establish some form of 'regulatory' or 'channelling' body so as to influence the transfer of technology to industry. Concern has been directed not only to the role of foreign technology but also to the transfer of technology from scientific research bodies and design-and-development organisations to industry. This latter concern is quite significant since literally hundreds of laboratories have been set up in the past to service (and did service) Egypt's industry, essentially the Public Sector.

While it is universally admitted that the technology being applied in industry is outmoded, and injections of modern technology is desirable, there is equal concern that its unbridled imports is going to both increase the country's technological dependence and underutilise indigenous capabilities. There is also a vocal school of opinion that true Egyptian development, which is also socio-economic development, cannot take place unless the country's own scientific manpower addresses itself to, and solves its problems.

The Nation's scientific planners have, therefore, acted as pressure groups to maintain science-industry or technology-industry linkages. It is argued that both foreign and indigeneous technology are needed in Egypt and it is a responsibility on the country to forge a Technology Policy that will allocate the tasks. Thus, the scientific community sees transfer and

development of technology as a single, central and indivisible conceptual entity.

The expression of this viewpoint by the apex S & T organisation in Egypt is first taken.

Efforts of the Academy of Scientific Research and Technology (ASRT)

ASRT, as a central body for science and technology, was constituted by Presidential Decree in 1971. Its President is of Ministerial rank and has direct access to the President of the Republic. The basic functions of ASRT are:

- to support scientific research directed to solution of national problems.
- encourage application of modern technology to economic and social development
- encourage strong linkages at the national level among scientific and technological organisations
- to coordinate and participate in scientific and technological research and in desemmination of information on modern technologies.

It has 16 specialised Research Councils covering 80 research organisations and centres and a total research staff of several thousand. The Patent Office is affiliated to ASRT as are some 10 other autonomous scientific organisations.

The Academy set up a Principal Committee on Transfer of Technology in October 1978, the responsibilities of which are now included in newly formed Principal Committee on Scientific and Technological Policies (Dec 1979).

In addition, ASRT has created the Centre for Transfer and Adaptation of Technology (TAT), attached to the Office of the President of the Academy. In the time of writing this Report (March 1980), the Centre has only an informal group associated with it.

It has been proposed that the Center will initially be guided by a high-level Advisory Committee (which has been constituted with 40 members representing all the Ministries and Institutions concerned with development and transfer of technology).

The Academy has had discussions with the European Economic Community (EEC) several times on support for the Centre. It is reported that "agreement " on the allocation of $2 million in the cooperation programme has been attained".

ASRT has had UNCTAD advisory services in regards to this Centre (Report by Ewing and Osman Hassan, November 1978), UNCTAD has recommended the formation of a National Centre of the Transfer and Development of Technology affiliated to the Academy, with linkages with institutions working in the technology and transfer of technology area.

UNCTAD has defined the role of the Centre along the following principal lines:

1. Preparation and execution of policies for the development of domestic technology.
2. Formulation and monitoring of guidelines for import of technology (day-to-day and sectoral responsibility with GOFI, Agriculture Research Centre (?) - Ministry of Power (?) etc)
3. Undertaking of major studies (sectoral assessment of technological situation in Egypt; sources of technological information)

4. Formulation of proposals for revised or new new legislation for transfer of technology.

5. Acting as technical secretariat for Transfer of Technology Committee.

In a document titled 'Memorandum on Cooperation between A.R.E. and EEC in the establishment of an Egyptian Centre for Transfer and Development of Technology" prepared by ASRT, dated January 1980 (prior to ASRT's proposed meeting with EEC), a comprehensive outline of the functions of the TAT Centre have been furnished, with the document acknowledging recommendations made by UNCTAD.

Out of 22 functions proposed for the Centre, half relate to the creation of an information system in the Centre or to linkages with sources of information, principally in matters of alternate technologies, national R&D-T linkages in other countries international models of technology policies and usage of technology in Egypt.

Important to the purposes of this Report are the following

a. cooperation with concerned bodies in the formulation of national policy guidelines and the development of arrangements for the regulation of processes and operations of horizontal transfer of technology.

b. formulation of national technological strategy and subsequently technology plan

c. compilation of a national registry of all transfer contracts in the Public Sector.

The Initiatives taken by GOFI

As far back as 1975, GOFI had invited UNIDO to review the transfer of technology environment in Egypt and to recommend methodologies of strengthening national bargaining power in the acquisition of foreign technology.
The timing was appropriate in that Egypt had announced its Open Door Policy and Law 43 had been enacted. Although, as stated earlier, GAFI was the competent body for the approval of joint-ventures, the technical and technological appraisal task was to be that of GOFI's.

UNIDO's Mission in 1975 (Project No. VC/EGY/75/069), after reviewing the situation in Egypt and GOFI's interests, emphasised that the selection and evaluation of technology was a fairly distinct task from the evaluation of the contractual conditions under which technology was transferred. It was recommended that the latter needed a specialised skill as well as a special approach which GOFI should develop. Furthermore, the Mission recommended the introduction of an explicit regulatory and promotional measures in the field of technology transfer.

The Mission recognised, at the same time, the need for technology transfer policies which would develop a more efficient process for the selection of technology, the aforesaid negotiating and contracting skills, and mechanism for adaptation and creation of local technologies and capabilities.

A programme of joint GOFI-UNIDO effort was developed but it did not crystalise till a second Mission was completed in June 1979.

The basic rationale for proposing a 'registry' for technology transfer (as defined in Project DP/EGY/78/001/A) in GOFI has been the consideration that GOFI, directly or indirectly, is involved in the techno-economic evaluation of over 70% of Egypt's projects, both in the Public and Private sectors, inclusive of these proposing joint-ventures in industry. Further, the concept was supported by the prevailing responsibilities of GOFI in the

- dessemination of information and innovations in know how
- solving technical and technological problems
- participation in negotiating technical cooperation agreements
- promotion of industrial design, and
- concluding contracts for machinery, accessories and spares.

Other Influences

Concurrent to the above approaches, Egypt presented its "Second Draft National Paper of Egypt" (UNESCO, E/ECWA/NR7 CONF.2/CP.5) at the Second Regional Preparatory Meeting for U.N. Conference on Science and Technology for Development (Sept. 1978)

The paper expressly noted "unfavourable influence" in foreign transfers of technology as:

- imposition of expatriate personnel
- export restrictions
- unfair rights of supervision over production
- restriction on the right to contract with third parties, &
- High royalties

and noted weaknesses in the Egyptian system as:

- difficulties of making sound estimates of price to be paid for technology
- uncertainty as to best available technology
- need for monitoring transfer of technology contracts, and
- need for an "optimum formula" for transfer of technology agreements

and, as in ASRT's efforts, the Paper emphasised the science-technology linkage, without which the scientific community would be isolated from national technological effort.

Reference needs also to be made to the call for a Technology Policy in Egypt, an outline for such a policy being recommended by Dr. Q.A. El-kholy in "The Structure and Functioning of Technology Systems in Developing Countries" (UNIDO ID/WG.301/2 (June 1979) - See Section V.

Thus, in summary, we have essentially three approaches to 'transfer of technology', defining the phrase in its different conotations: (1) the science-technology linkages envisioned by ASRT which considers the transfer of technology from abroad as indivisible from development (and adaptation) of indigeneous technology (2) the GOFI/'National Paper' approach to the appraisal of incoming technology in terms of its selectivity, negotiation parameters, and the strengthening of national bargaining power, and (3) the Technology Policy approach which considers transfer of technology as a subsystem of overall technology management, the Policy itself linked to social implications.

POLICY FRAMEWORK FOR ADMINISTRATION OF TECHNOLOGY

As a prime objective of this Report is to set the context for a technology regulatory office in Egypt and to define its ambit of operations, it would be useful to identify its placement in the general policy framework of country and the needs of the current environment.

The implications of prevailing policies, and the general requirements for new initiatives, have already been touched upon in preceding material. At this point, a broad summarisation of the framework is attempted under three classifications. The most important factor that needs to be kept in mind while reviewing this summarisation is that Egypt is essentially and presently in a correctional phase in its industrial-technological evolution, pursuant to accelerated (and redistributive) growth.

Economic and Industrial Policies

a) to set in motion mechanisms for a 8-fold growth in GDP over the 1975-2000 period in a framework of socio-economic justice.

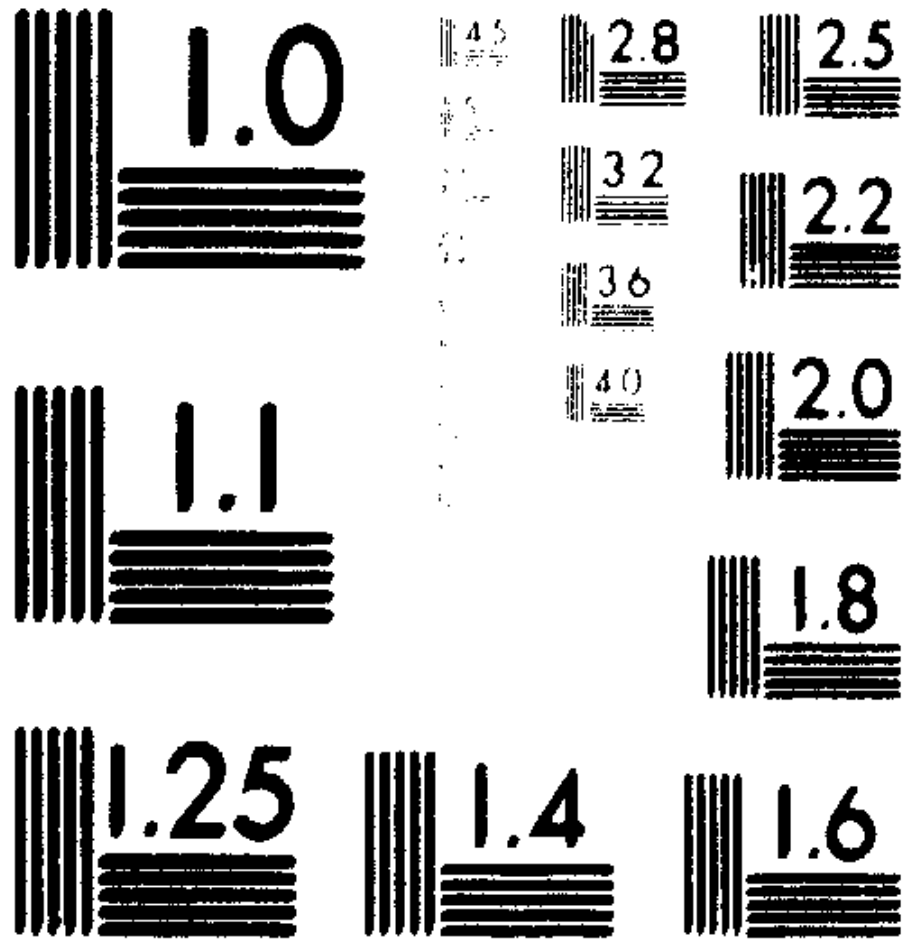
b) to transform a quasi-agricultural society into an industrial one

c) to achieve growth through rapid industrialisation and the use of modern technology

d) to reconstruct, rehabilitate and modernise existing industry in the Public Sector.

e) to create an effective private sector and enlarge entrepreneurial activity

f) to develop an adequate infrastructure to absorb economic growth



g) to encourage foreign investment where it serves socio-economic purpose

h) to increase the revenue base and enlarge foreign exchange earnings

i) to decentralise decision-taking in the Public Sector and governmental administration

j) to improve management efficiencies in the industrial and commercial sectors, and

k) to encourage modern small-scale industry in an overall system of balanced growth.

Technology- Oriented Policies

a) to use technology as a major instrument of socio-economic development

b) to promote adaptation of imported technology

c) to improve the science-technology linkage and make science the servant of urgent societal needs

d) to improve and usefully employ scientific and technological talent in the country

e) to encourage horizontal transfers of technology

f) to improve the technology information system and build linkages with international information systems.

g) to stem unbridled imports of inconsequential technologies

h) to develop skills for the evaluation of foreign technology

i) to develop regulatory mechanisms for the supervision of technology transfer and

j) to formulate and implement a comprehensive technology Policy for Egypt.

Supervision of Contractual Terms in Transfer of Technology

a) to regulate unfair practices in transfers of technology

b) to ensure the acquisition of genuine technologies

c) to associate management needs with needs in technology

d) to develop methodologies for the pricing of technology and an 'optimum formula' for reviewing contracts

e) to assess payments for technology in the context of its impact on domestic industrialisation and balance of payments; to develop the needed information base

f) to promote 'unpackaging' of technology

g) to monitor transfer of technology contracts for transcriptions of warranted performance , and

h) to redress the anomaly which arises from the fact that technology with investment ('packaged technology') is given incentives while unpackaged direct transfers of technology is neither institutionalised (i.e. provided a 'channel') nor favoured.

Taking an 'encompassing view' of the interactive effects of the above policies, and noting th general absence of necessary sub-systems in Egypt for their coordination - institutional mechanisms and subordinate policy structures - this Report views that any 'regulatory' or 'channelising' office for the supervision of transfers of technology to Egypt should have a broader perspective of its responsibilities than has been the case for counterpart offices in other developing countries. Thus, it is perhaps apt for Egypt to title its proposed office the 'Technology Transfer Centre.'

OPTIONAL POLICIES FOR TECHNOLOGY REGULATION/SUPERVISION IN EGYPT

Before making the Recommendations of Section IV, the Mission evaluated the alternate policies that are potentially available to the Egyptian Government. These would be :

(a) Central Regulatory Office for Technology Transfer (as in Mexico or Spain)

(b) Separate Approval Authority for Direct Transfers of Technology

(c) Departmentalised (Decentralised) Approved Systems for Direct Transfers of Technology

(d) Centralised Administration System Under Law 21 for Approval of Contracts.

(e) Localised Administration - (GOFI)

(f) Centralised Appraisal System for Technology Agreements (Recommendation of Mission)

Their strengths and weaknesses are analysed below. (See Figures VII-XI).

Central Regulatory Office for Technology Transfer (figure VII)

In this report the term "regulatory Office" (for technology transfer), where used, is merely used to advertise the fact that Egypt is establishing a technology transfer office which has approximate equivalents, or counterparts, in other developing countries (Mexico, India, Spain, Phillipines, etc.), The express creation of any such single central regulatory office in Egypt (with rights accorded to it by Law for the acceptance or rejection of any technology contract including that in joint-venture)

would have the connotations of both 'centralisation' and 'regulation' which would be contrary to the Open Door Policy of decentralised decision-making in the Governmental administration and the concommittant context that Egypt's posture to foreign technology is not defensive, or regulatory, in character but forwithly promotional (Law 43)

Furthermore, with GAFI already 'in place', with authority accorded to it, by Law, for the central approval of joint-ventures, any need for the central regulation of all transfers of technology can only be (reasonably) met by incorporating the new 'all agreements' responsibility into GAFI's structure.
This, of course, even if feasible, is a moot concept since it defeats the objective of decentralisation.

However, UNCTAD, in its report to the Academy (ASRT) has suggested new or revised legislation for transfer of technology without addressing itself to conflicts with Law 43 or needed compromises.

Separate Approval Authority for Direct Transfers of Technology (figure VIII)

The objectives of technology monitoring can be met, and decentralisation secured, if it was feasible to have two centres for the approval of technology: GAFI, for technology associated with joint-ventures, and a newly created body for all direct transfers of technology.
There is substance to this concept. It would solve the anomaly pointed out earlier that 'packaged technology' (the joint-venture) is institutionalised in Egypt and

Figure VII

Alternative A

Central Regulatory Office for Technology Transfer.

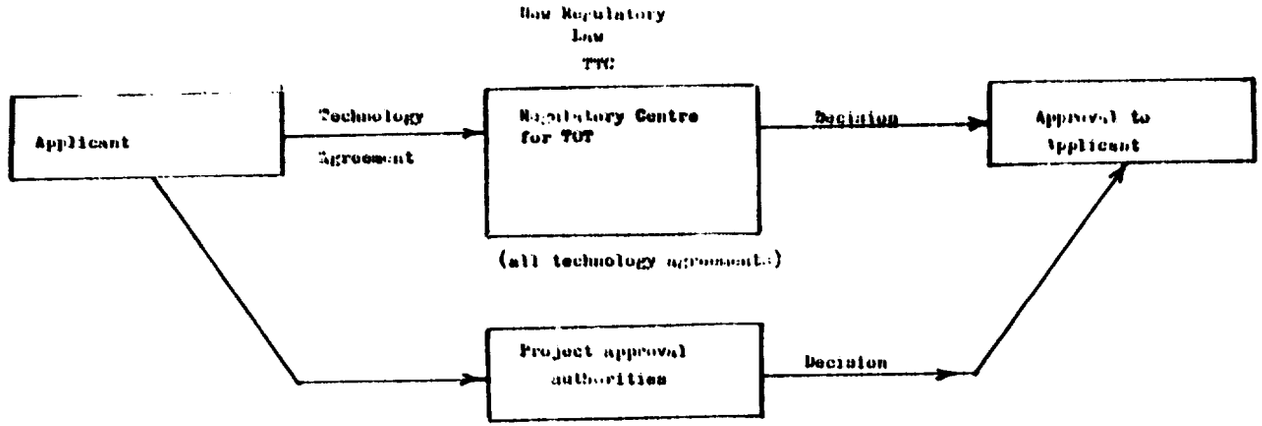


Figure VIII

Alternative B

Separate Approval Authority for Direct Transfers of Technology

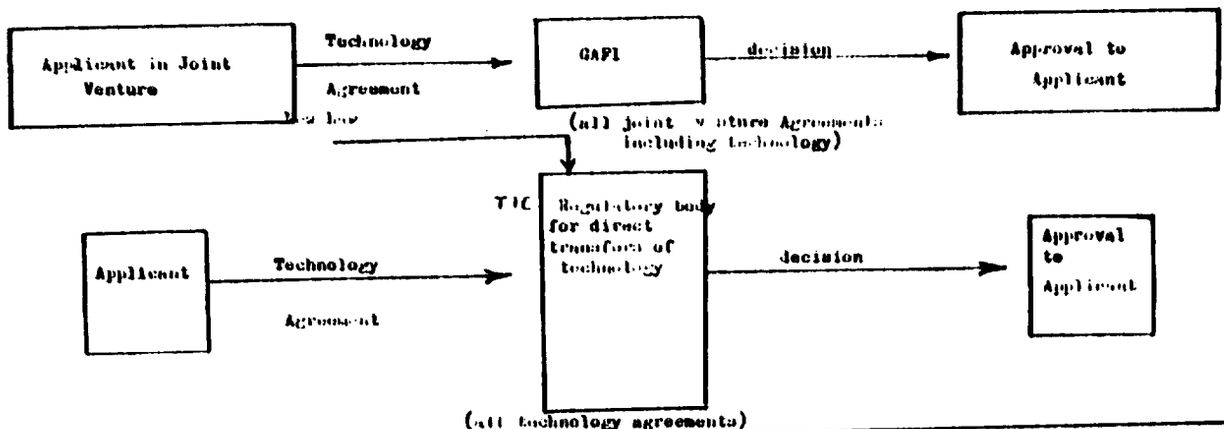
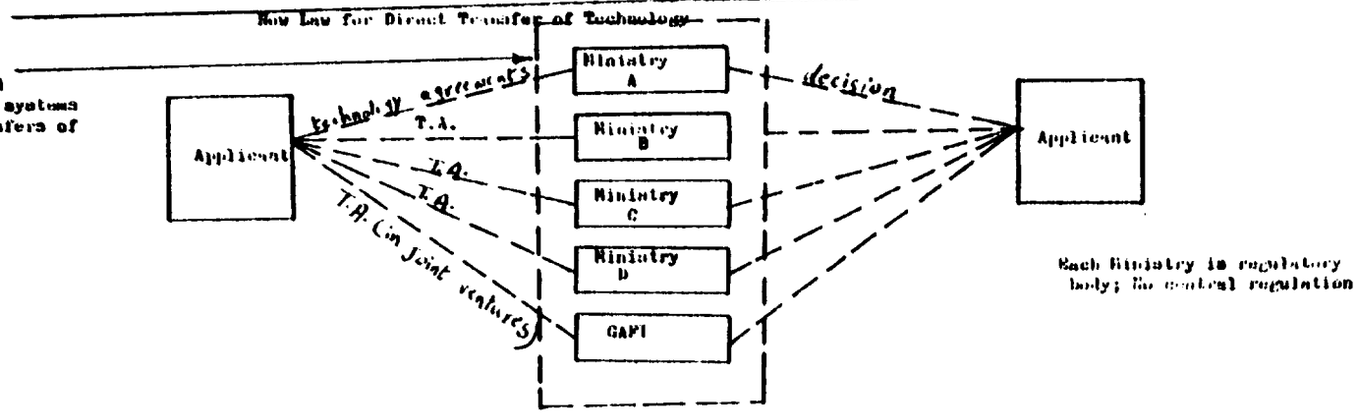


Figure IX

Alternative C

Departmentalized (decentralized) systems for Direct Transfers of Technology



provided incentives whereas direct transfers, which have much to their credit, neither have a specific gateway nor are given any special priviliges.

This alternative also poses difficulties in the Egypt's administration system. First, a new law becomes necessary to form this new (second) body and to give it the required authority: to act as the sole body for the approval of direct transfers of technology. Second, it divides project approval authority. That is, the procedure requires the Ministry to approve the 'project' alone (in the context of the industry which is within its jurisdiction) and the new body to approve the technology and/or its contractual conditions, where there is an agreement. Third, there is the potential problem that technology associated with investment may be treated differently than if it was not so associated. Lastly, the number of agreements with direct transfers of technology would have to be large enough to warrant the new law.

Departmentalised (Decentralised) Approval Systems for Direct Transfers of Technology (figure IX)

A third alternative is, again, to create a new law (on direct transfers of technology) but to leave the application of the law to the several project-approval bodies (GOFI, the Ministries). This provides for a regulatory/supervisory system but does not call for a separate regulatory office* with centralised powers.

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* an administrative office for making and issuing rules etc. would be required as is usual with issuance of regulatory laws.

This concept would be a viable alternative only under the condition that the law is explicit and comprehensive enough (detailed) so that its interpretation by the several project-approval authorities is consistent and uniform (not subjective or arbitrary). However, such a procedure reduces flexibility in the handling of transfers of technology and sets too rigid a standard. It would not be workable in the situation of a developing country*. This procedure, furthermore, calls for each project-approval authority (Ministry) to have its own specialised cell for the scrutiny of contractual conditions. This would be a difficult task in Egypt.

Centralised Administration System Under Law 21 for Approval of Contracts. (figure X)

Discussions with legal personnel at GOFI has disclosed that the ambit of Law 21 (of 1958), together with its rule making power, is wide enough for central administration of technology contracts. A straight-forward ruling can cause applicants for Industrial Licenses to submit technology agreements to any specified body. In this approach, as in previous cases, the requirement for an applicable law remains but no new law is necessary. In the concept, the central administrative unit would share** decision-making powers

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* This type of regulatory procedure is commonly adopted in advanced countries, viz. Anti-trust laws of the U.S.A. or the EEC.

** With the Ministry having jurisdiction for the product/project.

Figure I Centralised Administration System under Law 21 for Approval of Direct Transfers of Technology

Alternative D

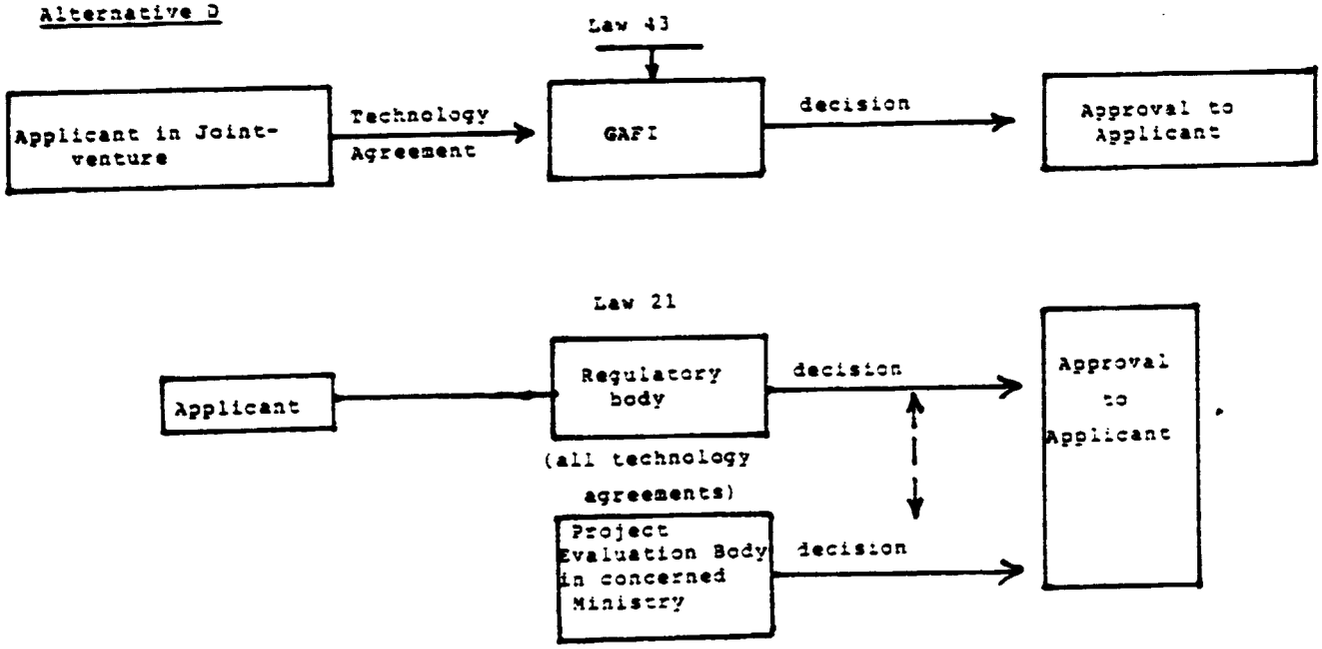
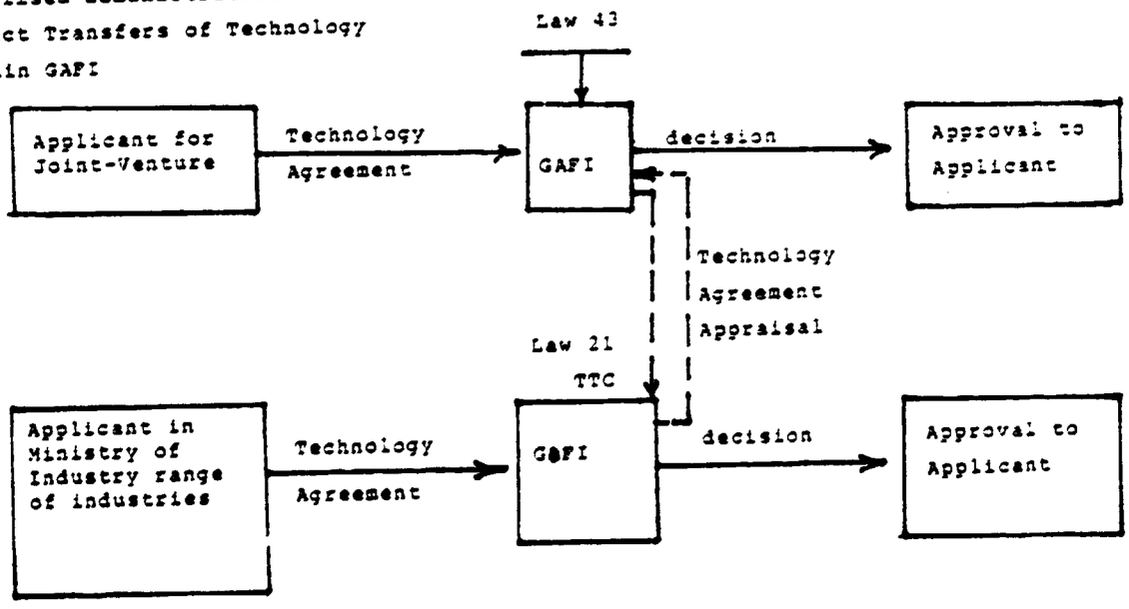


Figure II

Alternative E

Localised administration of Direct Transfers of Technology Within GAFI



on the acceptability of contractual terms in direct transfers of technology. This is the most feasible of the alternatives discussed so far. Three situations must be noted: (1) 'centralisation' is being attempted (2) technology agreements associated with joint-ventures would be outside the units' decision coverage and (3) the proposed system, once again, divides project approval authority, with the Ministry for the 'project' and the unit for contractual terms in technology transfer. This latter division appears to be an unacceptable proposition in the Egyptian context. Particularly, the Public Sector Companies, who have only recently won the right to take decisions on projects whose investments are below L.E. 750,000, including technology licenses, would resist the reversion to centralisation.

Localised Administration - (GOFI)

One of the basic concepts around which the current UNDP Project, on the formation of a National Registry* for Technology Transfer in Egypt, was mooted was that GOFI directly or indirectly participated in over 70% of project approvals in the country, and hence a Registry in GOFI, or within the purview of GOFI, would be controlling the bulk of the technology that was entering Egypt. Second, as GOFI has executive powers delegated to it by the Ministry of Industry for approval or projects coming within the authority of the Ministry, the Registry would, or could, have executive power for the approval of contractual

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* 'Registry' and 'Regulatory' offices are synonomous terms in licensing literature.

conditions in technology transfer. (This type of 'executive power' is already present in Departments of GOFI as 'Local Manufactures' or the Industrial Licensing Committee). Third, a Registry within GOFI, would enable it to 'sharpen its tools of trade' and move, at a later period, onto the national scene, when it might even be feasible to introduce comprehensive legislation for supervising all transfers of technology. Fourthly, the organisation of a nucleus group drawn from GOFI's personnel was readily feasible and its supervision needs could be incorporated into GOFI's existing pyramidal structure. Fifthly, and lastly, GOFI had taken the initiative for a registry thus indicative of executive will to implement its plans of technology regulation.

There is substantial merit to this concept, and perhaps, it may be the only way of proceeding in the interim period till conditions favour the implementation of preferred alternative suggested in Section IV (the recommendation of this Mission).

There are, however, many factors to be kept in mind in using this interim concept.

First, the GOFI office (registry) would not be a 'national centre', which UNIDO has generally recommended to developing countries which is the intended work of the present Mission. There appears to be no developing country, which has a technology regulatory system which is not centralised.

Second, in a developing country, the largest number of troublesome agreements (where excessive payments are demanded, extended secrecy cover is required, and restrictive clauses most prevalent) are in the fields of petrochemicals, petroleum processing, pharmaceuticals, pesticides and the like which areas are outside of GOFI's executive, or review, ambit.

Third, Law 43 permits and encourages the entry of investments (not necessarily involving technology) in which patents, trademarks and franchise rights prevail. Many agreements relating to these forms of 'intellectual property' (where potential damage to the country is significant) would not ordinarily come to GOFI. Also, there is currently no law or administrative provision that requires the review of straight-forward consultancy agreements* (See Section IV) which are important elements in the transfer of technology process.

Fourth, there is an overt 'technical' and 'public sector' bias in GOFI's administrative structure (for historical reasons) which would detract, rather than foster, the evolution and application of skills in the 'new knowledge system' bequeathed by international transfers of technology. That is, the basic 'legal-administrative' coloration that should prevail in a registry is unlikely to be present.

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* unless in joint-venture (Law 43)

If evaluation, selection, and the determination of the right, or appropriate technology for Egypt was a primary, or a dual focus of the registry, then alone would its location in GOFI be a preferred alternative.*

Nothing in the above discussion implies that GOFI should not be the organisation which would have authority over the Registry. This Report makes no recommendations on the final authority structure for the Technology Transfer Center, considering decisions in this matter to be wholly those of Egyptian determination after the alternatives analysed and suggested in this Report are reviewed by the Government.

Centralised Appraisal System for Technology Agreements (figure XI)

This Report, in the following Section, recommends that a centralised appraisal system be adopted by the Government for the review of all technology agreements in Egypt. It is recommended that the Technology Transfer Center should be an advisory or a recommendatory secretariat for all Ministries (and GAFI) involved in the approval of industrial projects. It concepts the appraisal function within the overall Governmental system in a matrix where project APPROVAL authority is decentralised (as now prevails) but where the APPRAISAL of technology contracts is centralised.

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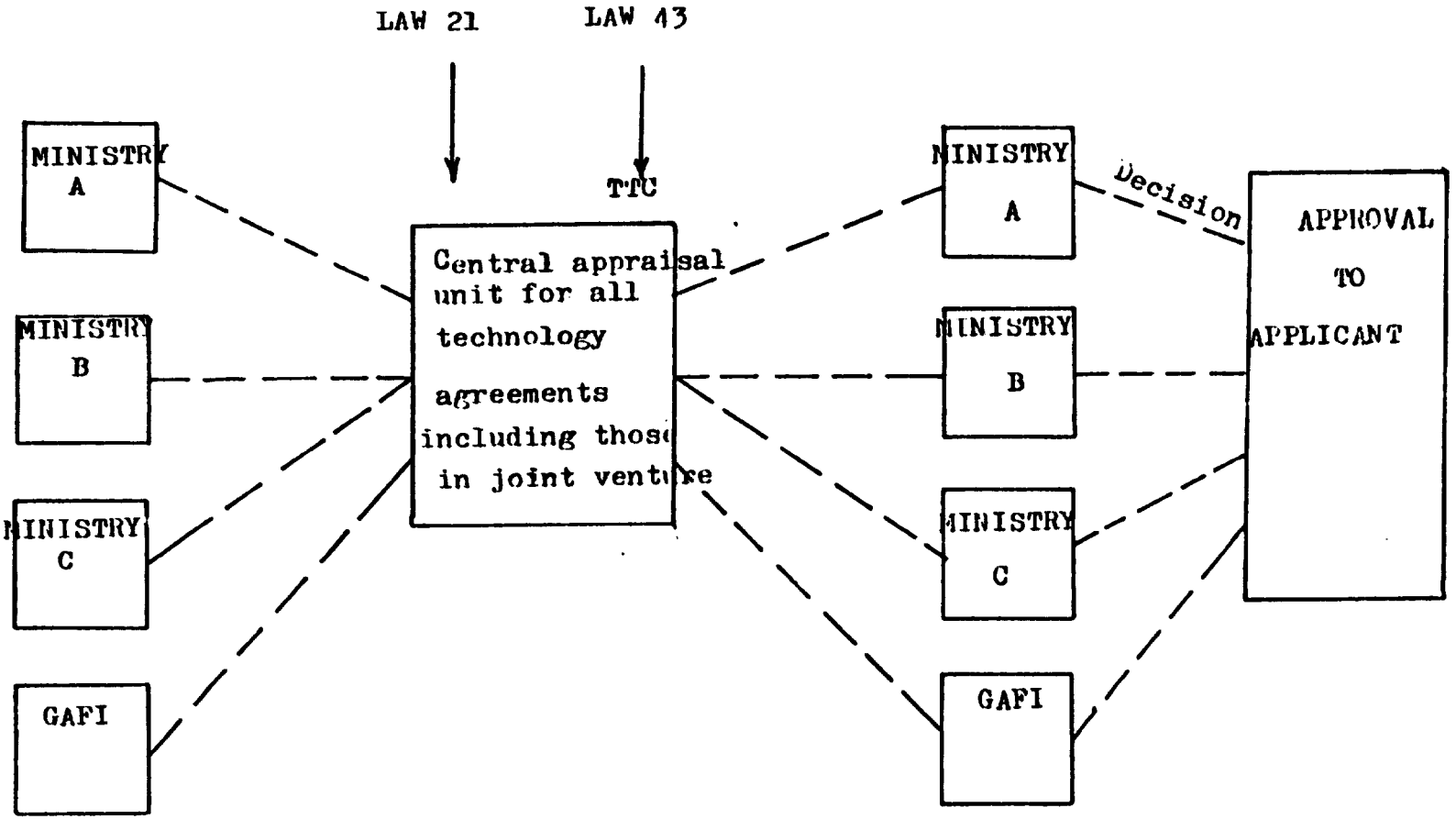
* Many technologies cannot be evaluated in advance of an executed agreement; for example, silver oxide dry-cells (discussed in a seminar with the TTC group).

Figure XI. **ALTERNATIVE F -**

Centralised Appraisal System for Technology Agreements



The Report, furthermore, posits that the only way that a uniform, consistent and stable system of contract approvals and appraisals can prevail, and Egypt's large policy objectives served, is when the Technology Transfer Center and the approval groups in Ministries subscribe to a common evaluatory policy - The Transfer of Technology Policy. (Section V).

SECTION IV: RECOMMENDATIONS - TECHNOLOGY TRANSFER CENTRE (NATIONAL OFFICE FOR THE SUPERVISION OF TECHNOLOGY CONTRACTS)

INTRODUCTION

In this Section, the basic recommendations of the Mission are presented and concern:

I. The Role and Functions of a Technology Transfer Centre (TTC)

II. Technology Policy and TTC

III. Functional Placement of TTC in the Egyptian Governmental System, and

IV. Considerations in Authority Structure for the TTC

In each of these areas draft recommendations were presented in the form of Working Papers */ (there being four such papers over a period of 3 months). Each Working Paper indicated its reference framework and linkages with previous Working Papers. The Papers were discussed at length with counterparts in the TTC and modifications made. These senior officers of the TTC were present in all meetings: Mr. Ahmed M. Nosseir - Adviser, GOFI, Dr. Mohamed Ahmed Aglan - Advisor, GOFI and Eng. Mohamed Amin, Head, TTC (GOFI). Mr. Abd El-Aziz Ismail of GOFI's Law Department was present at discussions of Papers I and III.

Prior to the discussion of Working paper III - "The Functional Placement of TTC in the Egyptian Governmental System', general discussions on the supervision needs in the transfer of technology process were individually held with senior officers of GOFI, GAFI and the Academy. The following is a listing of the Government personnel whom the Consultant had the pleasure and opportunity to meet in this regard:

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*/ Because repetiuous terms and preparatory assumptions pervade the Working Papers, and convey no additional thought than discussed here they are not appended to this Report. Original Working Papers remain with TTC.

Mr. Ibrahim Sharkass - GOFI
Mr. Allaa Khalil - GAFI
Dr. Adel Talaat - GAFI
Mr. Shawky El-Nahas- GOFI
Mr. Abbas El-Hosseiney - Industrial Registry
Eng. Kamal Maksoud - GOFI
Dr. Wahby G. Wahba - GAFI
Dr. O.A. El-Kholy - ALECSO
Eng. Malek M. El Ashkar - GOFI
Dr. Youssef Mazhar, EIDDC
Mr. Salah Fahmy

All of the above personnel endorsed the general approach proposed by the Consultant that a central appraisal office for the evaluation of technology agreement would be desirable in the context of Egypt and that such an office should be governed by a policy to which all concerned would subscribe to.

No discussions were held with Ministries reviewing technology contracts in particular areas as pharmaceuticals, petrochemicals, etc. other than with the Ministry of Industry and Mineral Wealth (via GOFI). Meetings with these Ministries were apparently not feasible. However, their endorsement of the recommendations of this Report would be desirable before the overall Project (UNDP Programme) moves further.

All recommendations and parameters of the Working Papers are presented in the ensuing material.

Definitions

Because different meanings can be accorded to terms used in the forthcoming set of recommendations, the following terminology has been proposed:

Product: Goods and articles commercially marketted and produced through an industrial manufacturing process.

Production System: The main line of equipment and machinery used in a factory for the manufacture of products.

Technology: The 'know-how', 'recepie' or set of industrial techniques that the production system will commercially apply to manufacture products; the principal object of technology transfer.

Project: The entire facility comprised of land, buildings, etc. in which the production system is used and where transferred technology will be employed.

Technology Agreement:

(a) the agreement that confers authority on the recepient enterprise to employ the technology transferred to it and one which represents the exchange of obligations between the parties;

(b) an agreement which concerns technical services to be performed by the 'licensor', including consultancy services; and

(c) technology-related agreements covering aspects in trademarks, patents and franchise.

Where unspecified, the agreement would prevail between Egyptian and non-Egyptian persons, including companies.

I. THE ROLE AND FUNCTIONS OF THE TECHNOLOGY TRANSFER CENTRE

Since supervision of technology agreements is desired by Governmental authorities, and since in the existing systems and forms of Governmental administration in Egypt decision-authority for projects, and technology agreements associated with projects, is with several Ministries, GOFI, and GAFI, and it is impractical to divide such authority so as to centralise decision-authority for technology agreements alone, the recommended optimum mechanism for the critical and special evaluation of technology agreements would be to organise a central appraisal agency for technology agreements. The Technology Transfer Centre (TTC) can function as such.

TTC, in this concept, will not have the character of a decision-body in any matter concerning contractual arrangements between parties to a technology agreement. It will develop into a single, central and specialised unit with the objective of serving as a recommendatory Secretariat to all authorities approving technology agreements. In this proposal each project authority will be the only body with rights of approval over matters of technology coming within its fields of jurisdiction. Each such authority is, in final terms, a regulatory organisation. Thus, the desired objectives of 'regulation' and 'decentralisation' are met without loss of detailed appraisal of technology agreements.

Since straight-forward decentralisation in the regulation of technology can introduce subjectivity and arbitrariness to the criteria applied by different project-approval bodies for acceptances of contractual terms, and this is undesirable in any concept of a national approach to technology transfer, a concommittant requirement would be to create a co-ordinating instrument. After analyzing the alternative of introducing new legislation or the establishment of a common administrative policy, the Mission recommends the co-ordinating instrument as policy under the title of "Transfer of Technology Policy" (TOT Policy) to which all project approval bodies and the TTC would subscribe to. Properly framed and constructed, the Policy should lead to a consistent, clear and stable system for the supervision of technology inflows.

This Mission, however, views that the TOT Policy for Egypt should not merely be the instrument of co-ordination but have a wider perspective of technology purpose. Approvals of foreign technology, and terms of its acceptance, it is presented, should not by inattention or disregard have unanticipated adverse impact on other sectors of the economy or hurt or hinder their expected development. Likewise, TOT Policy, it is argued should reward or penalise technologies from the context of their contribution to socio-economic development. TOT Policy, it is presented, should have its placement in, and be a subordinate policy to, a parent or principal policy, defined in this Report as Technology Policy: a policy that assigns the functions of technology in the matrix of society. In this concept, the TOT Policy is the governing policy for the acceptance of contractual terms in technology agreements; the reasons, purpose and scope of governance would be set out in the Technology Policy.

Till the time a Technology Policy is formulated (Section V) and expression given to the specific role of foreign technology in Egypt, it is recommended that an Interim TOT Policy should be developed to guide the TTC and the project-approval authorities. In this Report the effort has been made to present a draft TOT Policy (Section V) on the basis of the general needs and experience of developing countries modified by well-understood aspects of the Egyptian economic and industrial environment.

It is recommended that as a subscriber to TOT Policy, the main role of the TTC should be:

(i) to administer the TOT Policy, to the extent permitted by the policy, with assistance given to the formulators of the Policy as required, and

(ii) to act as the central appraisal unit for transfers of technology, bringing to the task the necessary support and expertise.

The main functions of the TTC, as viewed by the Mission, and mutually agreed to by the Consultant and members of TTC's nucleus group, would be:

(a) to review and evaluate technology agreements (in industrial technology) through legal, financial and technical screening disciplines;

(b) to rendering technology advisory services to interested potential users of foreign technology, including Egyptian institutions as the Public Sector;

(c) to assist interested parties on matters relating to the negotiation of technology agreements (without participation in negotiations, except, where required, by Public Sector institutions);

(d) to serve as the documentation and collation centre for technology agreements and on statistical financial information relating to technology payments; and

(d) to obtain representation on Committees approving projects involving technology agreements.

In order to perform its role, and fulfill the purposes behind systems of technology supervision in developing countries, the TTC shall have the right and responsibility to appraise all technology agreements except those bearing on:

(a) military projects,

(b) projects in the Free Zones, */ and

(c) large projects of the infrastructure or projects associated with multilateral agreements.

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*/ On the reasoning that technological decisions of the Free Zone enterprises do not affect the development of the industrial economy of Egypt.

In order to give a precise content to the term 'technology agreement' as it applies to the appraisal role of the TTC, all of the following agreements for the purchase or the licensing of technology, whether in the standard contract format or as proformas/invoices, will be considered as 'technology agreements' and thus subject to appraisal by the TTC:

i) Know-how agreements
ii) Patent agreements
iii) Trademark agreements (associated with industrial technology)
iv) Technical assistance agreements (production assistance)
v) 'Software' supply agreements
vi) Design-of-plant contracts
vii) Technician assistance agreements, and
viii) Consultancy services agreements (project feasibility, technology identification, licensing negotiation).

The term 'industrial technology' is used to distinguish such technology from those applied in water management, reclamations of barren land, etc.

Contracts and agreements generally outside the purview of the TTC would be 'Founders agreements' in joint-venture formation, management contracts, marketting agreements, construction contracts, and for the time being, management service contracts.

TTC's ambit of review will, further, cover all technology agreements independent of whether the recepient organisation is in the Egyptian Private Sector, a joint-venture in the Public or Private Sectors, or a wholly Egyptian Public Sector Unit. (The term Public Sector Unit would include 'running companies' of the Sector).

The term 'agreement' would also cover contracts in which technology is only one element of an overall purchase contract. */

Since in the overall recommendation, the TTC would be a new unit introduced into the existing governmental system, it is desirable that it complement existing functions and structures rather than absorb or modify them. It is, therefore, recommended that the TTC's operations will not extend to the review of:

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*/ Under the rule-making powers of Laws 21 and 43 it should be possible to discourage composite agreements as such lead to diffused presentations of accountability.

(a) project feasibility,

(b) suitability of technology, or entrepreneur's (applicant's) choice of technology (process or production route),

(c) source of technology (i.e. supplies of technology) - unless such review is a specific request of the project-approval authority, or

(d) projects not involving a technology agreement.

SPECIFIC FUNCTIONS OF THE TTC

The following are the recommendations of the Mission in respect of the detailed operations of the TTC, pursuant to the first two paragraphs on page 114.

Administration and Development of TOT Policy

The TOT Policy is a multi-agency exercise and one which is developed between the Project-approval authorities and the TTC, under the aegis or leadership of Technology Policy. The role of the TTC is to administer those elements of the Policy (TOT Policy) which are within its ambit of responsibility. Administration calls for the development of a set of guidelines and operating criteria which will be routinely used, by the 'workforce' of the TTC, to review and evaluate technology agreements. Administration would also call for the establishment of those linkages with the institutions/agencies that it will interface with (See figure XII).

Organization of TTC as central appraisal unit

Based on a tour undertaken by a team of three GCFI officers to Mexico, the Phillipines, The Republic of Korea and Spain, the present nucleus group of the TTC favours the 'three-component' legal-technical-economic appraisal system for technological agreements. At the same time it is recognised that project-approval authorities in Government do presently investigate (through services as that of the Technical Department of GCFI) techno-economic appraisals of projects. Consequently, it is necessary that the organization of TTC's appraisal unit must be formulated */ such that it brings to bear new skills and specialisations on the total 'project-technology contract system'. The appraisal unit should, thus, be organised to fulfill those deficiencies which are identifiable. At the present moment, these are:

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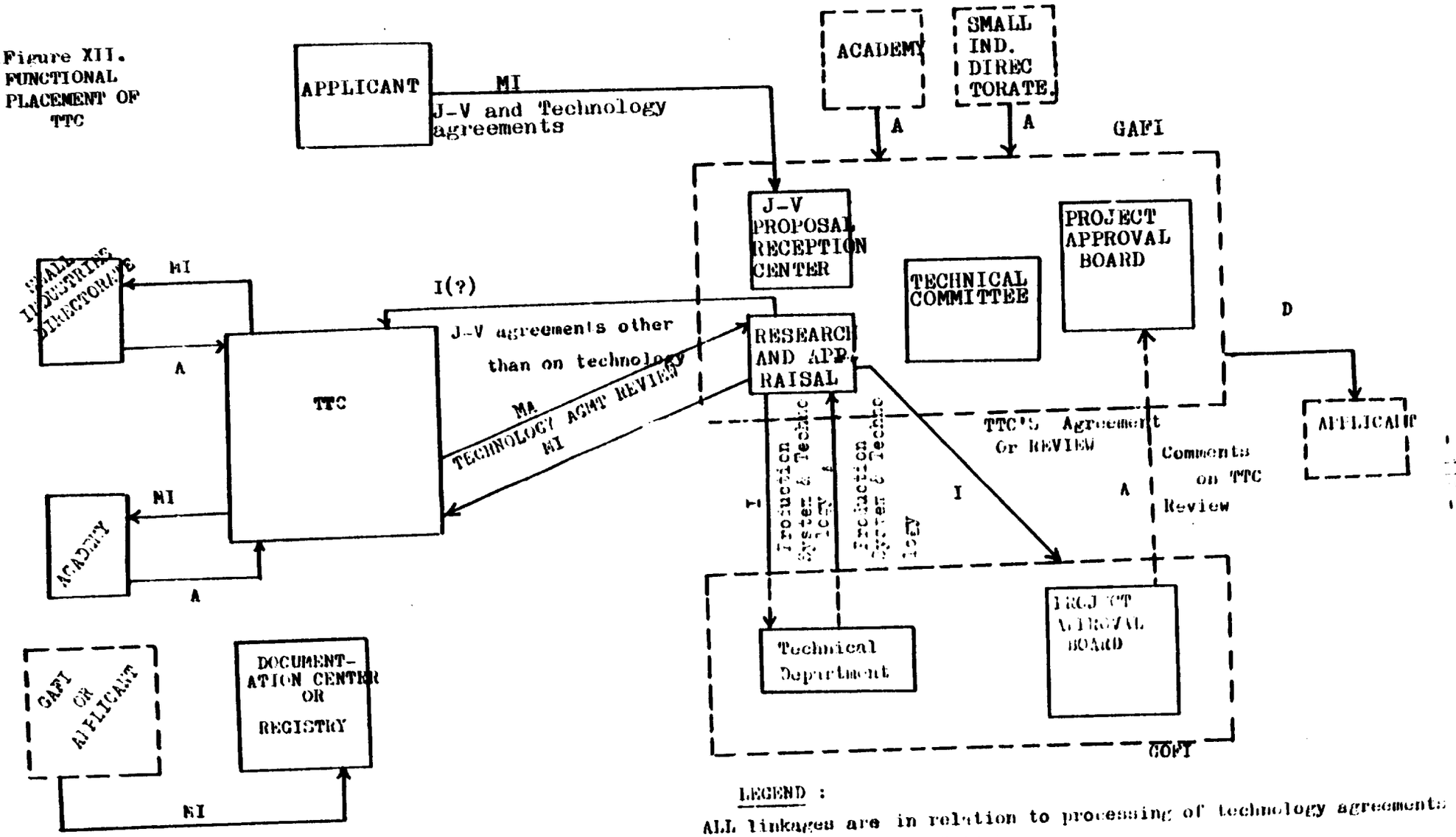
*/ A draft presentation was made to the TTC on 'The Organization of the TTC' but as it is judged, by the Consultant, to be a premature submission, it is not reviewed in the Mission Report.

Figure XII.
FUNCTIONAL
PLACEMENT OF
TTC



SOME SQUARES ARE REPEATED
FOR REASONS OF CLARITY

LEGEND :

ALL linkages are in relation to processing of technology agreements:

MI = " must inform" link

MA = " must advise" link

D = decision link

I = inform (casual linkage) link

A = Advise (casual linkage) link

(a) the attention paid to technology parameters as performance warranties, know-how representations,

(b) valuation of technology,

(c) patents and trademark rights,

(d) restrictive practices

(e) market rights

(f) technology-associated services as engineering consultancy,

(g) duration of agreements,

(h) technology-investment relationships in joint-venture agreements,

(i) evaluation of, or need for, management service contracts,

(j) 'absorption of technology' requirements,

(k) impact of foreign technology approvals on sectors of the economy

(l) impact of foreign technology approvals on indigeneous technology,

(m) documentation of agreements

(n) assessment of technology costs in relation to balance of payments,

(o) assistance to prospective licensees for negotiating contracts,

(p) information systems on appraisals of contracts, sources of technology, payments for technology, etc., and

(q) suitability of technology.

Review and Evaluation of Agreements

By legal, technical and financial screering. One of the major operative roles of the TTC should be to utilise guidelines and parametric criteria for the routine screening of technology agreements.

The basic exercises in the above three areas should be as follows:

Legal screening - to review and evaluate technology agreements so that they are not only reciprocally supportive of the private gains and private risks of the parties to the contract but these are subordinate to national gains and risks. Legal screening should, thus, involve:

- review of restrictive practices
- legal administrative requirements
- licensor's and licensee's representation clauses
- acceptability of operating restrictions on licensee
- reciprocity of obligations
- review of 'tied-in' agreements
- sufficiency review
    - patent grants
    - trademark rights
- management rights of licensee
- licensor liability
    - performance guarantees
    - other guarantees/warranties
- clause reviews and inter-clause consistency.

Technical screening - to review and evaluate the agreement so that the technical responsibility of the licensor, and the technical needs of the licensee, are met and are in balance. Technical screening will involve:

- Technical definitions in contract; their acceptability
- Know-how definition - the adequacy and sufficiency
- Credibility of licensor's/licensee's technical representations
- arrangements for the transfer of know-how
- continuity of licensor's services; need and sufficiency; licenses training
- Process guarantee evaluation
- Process improvements (reciprocity)
- R & D arrangements
- Project commissioning responsibility of licensor
- The relatedness of patents to know-how
- Duration of agreement (absorption)
- Review of 'Tie-in' agreemental plant design; construction; machinery; raw materials, management.

Financial Economic Evaluation - review and evaluate agreements so that payments to Licensor stand in equitable relationship to Licensee's operative advantage and that Licensee's payments are protected. Financial Economic Evaluation will involve.

- assessment of excess value-added
- royalty to excess value-added
- evaluation of alternative forms of payment
- licensor's financial liabilities on process performance; relatedness to payments; discharge of payments protection
- Tie-in payments (related agreements) and raw materials and components supplied by licensor
- separate payments for separate rights
- payment provisions for services

Technology Advisory Services

With the potential for high influx of technology under the 'Open Door Policy', particularly with the development of private Sector industry, it is anticipated that a considerable amount of secret and/or potential technology will flow into Egypt. It is thus likely that entrepreneurs will require advisory services both in the selection of technology (different suppliers of technology) and in the negotiation of technology agreements. It is recommended that the TTC should be organised to give such assistance. (At the same time it is recognised that "technology evaluation function" would be divided between the Ministry (e.g. the Technical Department of GOFI) that endorses a project and the TTC. The role of the TTC, consequently, would be to strengthen the bargaining power of the licensee by collaborating with the Ministries.

Negotiation of Technology Agreements

In the appreciation that the Public Sector in Egypt would continue for a long time, to be the main supplier of manufactured goods, industrial and consumer, it is desirable that the TTC should participate in the negotiation of important technology agreements.

In the case of Private Sector understandings, it is recommended that the TTC should act only as adviser to the Egyptian national entrepreneurs, if required, It is also generally recommended that the TTC should obtain the co-operation of industrial chambers in holding seminars and symposia on contractual matters of technology transfer so as to strengthen overall national bargaining power.

Documentation and Collation Centre

The transfer of technology to Egypt should strengthen and develop the industrial structure. One measurement would lie in its impact on the balance of payments. It is recommended that the TTC should have the responsibility to advise the Government, through project-approval authorities, of this impact. To perform this function the TTC should be able to obtain access to the payments made for technology and relate them to imports-substitution, employment and other economic-financial parameters.

Representation on Committees Approving Projects Involving Technology Agreements

The creation of the TTC as a central appraisal unit for technology agreements has artificially divided the overall responsibility of project acceptance, or evaluation, into two component functions: one dealing with the agreement alone, and the second, with the production-system and the technology it will apply. Both are specialised functions. Before final approval is given to the applicant-entrepreneur for a project, it is necessary that a systhesis or integration be effected between the two evaluations. This can best be done at the level of the project-approval committee when representatives of both the evaluation groups are present. Thus the recommendation that the TTC have representation (as a recommendatory body) on the project-approval Committee.

TECHNOLOGY POLICY AND THE TTC

If one had to characterise the current Egyptian economic-industrial situation in a single phrase it would be: the country is undergoing a strong correctional phase. Virtually an entire private industrial sector has to be created so as to encourage entrepreneurial activity and contribution as per the Open Door Policy. The outmoded Public Sector has to be revamped through rehabilitation and modernization. The excessive trading bias in the economy has to be diverted to manufacturing contribution. Socio-economic objectives, together with considerations in the efficient use of resources calls for the establishment of a small-scale industry using modern methods of production. The underutilisation of the nation's scientific manpower has to be kept from further deterioration and encouraged to accept new technological challenges. Steep pyramidal structure in industry, and absence of intersectoral linkages, have to be corrected through modern methods of industrial management, etc.

At the same time, foreign investment, technology and management are not complete solutions for all these situations although they may hasten the pace of their development. Overt reliance on them not only increases the country's technological dependence on outside sources but creates pressure groups and lobbies within the country to sustain them in priviliged position.

Conscious effort is, therefore, necessary to assign particular roles to foreign investment, management and technology (together and as separate entities) in the context of Egypt's development and to draft programmes which will minimise their need in the future.

With this in view, it has been suggested (see second paragraph on page 113) that the TTC should not merely serve as an appraisal unit for contractual conditions in technology transfer but have an enlarged perspective of the role of foreign technology in societal terms. It is recognised, however, that the TTC, as a specialised body bringing to bear a particular expertise on the review of technology agreements cannot set policy on the role of foreign technology. It has, consequently, been recommended that it should be governed by a TOT Policy which specifically defines this role. Under the aegis of this Policy, TTC would set conditions to, or grant favours to, foreign technology depending on the place allocated to it in

Egyptian industrial-economic development. */

In the viewpoint of this Mission, the role of foreign technology cannot be developed in the abstract. Its expected contribution would vary from nation to nation depending on a country's endowments, developmental stage of the economy, the legacies of historical policies, etc. and the vision and perseverence of its institutions. It is therefore recommended that the expected contribution from foreign technology must be developed from an overall view of the function of technology in the matrix of society. The technological needs of each economic sector of the country should be investigated and enunciated before the placement of foreign technology is decided. This, the Mission recommends, as one important function of Technology Policy.

Section V describes the Policy options open to Egypt's technology planners in this respect. The country's TOT Policy should be carried out from the exercise of the options presented.

A Draft Interim TOT Policy for Egypt has been constructed in Section V, derived from considerations in Technology Policy, so that the TTC (and project-approval bodies) can have an immediate operating base (if found suitable). It is in no way complete or comprehensive. That must come from Egyptian effort and it would be a multi-agency exercise. The TTC should be able to use this Policy draft for the development of detailed guidelines for the evaluation and modification of contractual conditions. To some extent, further UNIDO assistance may be required to accomplish this.

The TOT Policy is placed in Section V, along with considerations in Technology Policy, as it does not represent a recommendation of this Mission but basically a guideline. The need for a TOT Policy is, however, a firm recommendation.

FUNCTIONAL PLACEMENT OF THE TTC IN GOVERNMENTAL ADMINISTRATION

The term 'functional placement' is used in this Report in order to avoid considerations on the identification of the authority that will have administrative control over the TTC (See following discussion).

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*/ TTC's role being recommendatory, the 'setting' and 'granting' of rights is essentially that of the project-approval bodies.

Functional placement involves the establishment of relative responsibilities of interacting organizations through examination of the linkages that must be established between them in the decision-making process. This is accomplished in this Report by giving certain terminology to the linkages.

In the proposal made here, three essential operational linkages need to exist for TTC to function. These are the 'must inform', the 'must advise' and 'decide' linkages. In addition, two casual linkages, the 'inform' and 'advise' linkages are necessary to influence decision-making and also to serve the function of feedback.

Using this concept of linkages, figure XII is the proposed scheme of essential and casual linkages between GAFI, GOFI, TTC and other relevant organizations in the process involving the approval of joint-venture projects. GAFI has been taken as an illustration because it might present the most complex case. It is recognized that other essential or casual linkages may need to prevail or that some of the indicated linkages may not be practical or effective. It is hoped that further work in the UNDP Project will resolve these matters.

It is opined that TTC's linkages with other Ministries (involved in project-approvals) will present no greater complication than visualized in figure XII.

In suggesting the linkages of figure XII it is recognized that the introduction of the TTC lengthens the decision chain. However, attempts have been made to minimize this effect particularly by eliminating any 'must' linkage between the applicant (for a project) and the TTC although this linkage is a fundamental one in most developing countries having a regulatory office.

The 'must'linkages have to prevail if the TTC is to (a) serve its role in the evaluation of technology agreements and (b) participate in the overall process of technology management.

The 'must' linkages in relation to the Academy and the Small Industries Directorate, and the specific 'I' linkage between GAFI and "GOFI Project Approval Board" function, also serve objectives in Technology Policy (Section V). Essentially, these organizations need to be informed, in the process of project approvals, so that decisions on contractual obligations are not taken without considering their

adverse impact on existing industry, existing technology or plans for technology development.

In the illustration taken, GAFI first needs to advise the TTC that it is considering a project proposal which involves a technology agreement. To enable TTC's evaluation of it, the following additional information (nor normally found in the technology agreement) needs to be furnished to TTC:

(a) the technology to be used (evaluation of the Technical Department of GOFI)

(b) main parameters of the production system (evaluation of Technical Department)

(c) estimates of sales and fixed investment in the production system (GAFI's assessment)

The purpose of this information is to enable the screening of agreements by the 'three-component evaluation system' (See Role of the TTC, this Section).

Screening will indicate where the proposed agreement meets, or fails to meet, objectives in TOT Policy and needed corrective measures. This will be TTC's 'Agreement Review' - the 'must advise' linkage in Attachment A.

The separate 'I' linkage between GAFI and the TTC is optional to GAFI (Joint-venture agreements other than on technology). However, it must be noted that the usual practice in developing countries (not recommended in TOT Policy for Egypt) is to disallow payments for trademarks, etc., or disallow certain licensee obligations, if foreign venture partner has control over the management or dominant equity in the enterprise.

In the particular case of Joint-ventures, it has been pointed out in discussions that compensation for technology cannot be judged separately from capital participation parameters, and therefore, compatability tests should remain with the project approval body. This is entirely a discretionary matter, the rationale of evaluatory procedures only demanding that both factors be judged in a single exercise.

Since TTC, in effect, only administers TOT Policy and does not frame it, it is obviously desirable to have an Advisory Body to frame this Policy. The Advisory Body will, in fact, also be the body that defines Technology Policy (See following discussion).

CONSIDERATIONS IN AUTHORITY STRUCTURE FOR THE TTC

General

This Mission has basically recommended that a national office for the supervision of technology agreements should be established at the earliest, so that a coordinated approach can be taken to the role and place of foreign technology in Egypt. The term 'supervision' is used as the Mission considers that at present, it would be premature for it to make final recommendations on the ultimate REGULATORY form of the national office and its source of authority. Two other factors also underlie this approach: (a) the suggestions made in this Report, or in the Working Papers, have not been circulated in oral or written form to all, or even the principal, organisations concerned with the role of foreign technology in Egypt; thus there is no consensus whether such an office is feasible (see SectionI) or whether it should have a responsibility level other than supervisory, and (b) the reasoning that this Mission should not pre-empt the examination of other options since the Mission's effort represents only 10% or so of the total UNDP Project committment.

Within the range of options examined in this Report, the Mission opines that the Technology Transfer Centre (TTC) - the national office- should be a permanent structure with a Central Board of Technology Transfer (see later) having authority over it; the role of the TTC being recommendatory to project-approval authorities and controlled by a Transfer of Technology (TOT Policy), set

by the Central Board, the Policy outlining the role of foreign technology in Egypt.

However, the Egyptian Government may look upon this structuring as merely an interim arrangement, pursuant to TTC becoming a full-fledged regulatory agency with parallels in Mexico, Spain, India or the Phillipines, or the Government may consider the interim structure itself as too highly developed, and needed to be simplified with respect to its scope of activity or responsibility.

With such in view, this Mission <u>recommends</u> five other alternative concepts (options), each of which is regulatory and feasible within the Egyptian environment. These are listed and discussed below. These same options have been listed in Section III but without detailed considerations given to the authority structure under which the national office (TTC) would operate. (The options have also been diagrametically depicted in Figures VII-XI.) Five new options open to the Government are:

Option I: Central Regulatory Office for Technology Transfer

Option II: Separate Approval Authority for Direct Transfers of Technology.

Options III: Departmentalised (Decentralised) Approval Systems for Direct Transfers of Technology.

Option IV: Centralised Administration System Under Law 21 for approval of contracts.

Option V: Localised Administration - (GOFI)

In examining the Options, the following may be kept in mind:

- the effect the Option will have on Law 43, and on the place and role of GAFI; indeed, if GAFI's responsibility should be increased, decreased, modified or left unaffected.
- the applicability and the relevance of Law 21
- the need and reason for the enactment of new legislation (if any)
- whether the TTC is a decision-maker; or shares decisions; or is part of the 'decision-chain'
- how the option affects the present role of the Ministries in overall project-approval authority
- what instrument will govern the national office (TTC): law or administrative policy
- how the option affects technology agreements executed by Public Sector enterprises, and
- whether the entrepreneur/applicant directly approaches the TTC; whether the TTC gives its decision directly to the applicant.

In all of the Options discussed below, the continuance of GAFI and of the 'investment' and 'joint-venture' parts of Law 43 are explicitly recognised. In all but one of the Options (Option III), the TTC would have part or full decision authority; that is, either the TTC has a prime/sole role as decision-authority or shares the authority with another decision-body. The term 'decision', when applied to the National Office (TTC) is always in respect of contractual arrangements in technology transfer.

Option I: Central Regulatory Office

In Option I, the TTC is the sole decision-body for all technology agreements, independent of whether or not the recepient of technology is a joint-venture enterprise. Every licensee directly approaches the TTC for approval of the agreement. The TTC would have the right to reject the agreement if modifications suggested by it (if any) are unacceptable to the licensee. In Option I, GAFI would have approval rights only on parameters of investment, investment agreements, company statutes and company management. To give the TTC the above authority, new legislation would be required. TOT Policy would become encompassed in the new legislation. The legal rights now with GAFI vis-a-vis the approval of technology agreements would pass over to the TTC.

Option I is typically exercised in Mexico. This country has enacted separate and specific laws for the regulation of investment and technology contracts. In 1973, the management of two laws were with separate regulatory agencies. Today it is centralised under the Investment Authority. To obtain a close parallel in Egypt, the TTC would have to come within the administrative authority of GAFI.

Option II: Separate Approval Authority for Direct Transfers of Technology

In Option II, new legislation is enacted to give the TTC the sole right (authority) to approve all these technology agreements which are not associated with investment from the licensor.

GAFI, under Law 43, will continue to exercise its present authority over all arrangements in joint-venture. TTC and GAFI would each have its own apprasal system for evaluating agreements. However, a coordinating instrument would be necessary to give a national approach to technology transfer. This could either be TOT Policy or the new legislation. (That is, the new legislation could be the vehicle for TOT Policy). There are no close parallels to such a structuring in developing countries.

Option III: Decentralised Approval System

In Option III, each project-approval authroity (Ministry, GAFI) is its own regulatory authority. This is very close to the existing Egyptian system. The major contribution in Option III is that new legislation is enacted to limit the approval rights of the project-approval body. The new legislation would specify those nationally repugnant or restrictive practices which would per se be unacceptable in Egypt. In Option III, there is no separate central regulatory body. The 'TTC', in this Option, is merely an administrative office with legal-administrative functions with placement in the Ministry of Law. This type of system is generally followed by Yugoslavia and Argentina.

Option IV: Centralised Administration Under Law 21

In Option IV, unlike the situations in Options I to III, the TTC is not a legally created authority. It is merely a centrally

organised department with certain decision functions delegated to it by the Ministries, which alone have the authority under Law 21 for approving projects. The TTC, thus, becomes part of the decision-chain which accords approvals to projects. In the normal course, the TTC's decision on an agreement would be accepted by the concerned Ministry; however, it will be within the prerogative of the Ministry to act as it thinks fit, disregarding the advice of the TTC. In this Option, the TTC will have responsibility only for direct transfers of technology and licensees would approach it directly. To avoid potential conflict, only the Ministry would 'issue the approval' of the agreement. (GAFI could utilise the appraisal-capability of such a TTC for its decision processes). The TTC would very largely function as the present 'Local Manufactures' Department in GOFI does with respect to GOFI and GAFI projects. The TOT Policy, under which the TTC will operate, will have to be set by the Ministries concerned. In a very broad way, India utilises the system of Option IV.

Option V: Localised Administration - (GOFI).

In this Option, the TTC is a department of GOFI like the present Technical or Local Manufactures Departments. While GOFI would be the regulatory authority under Law 21, it would delegate to the TTC the rights to approve licensing agreements for direct transfers of Technology - but only to the extent of the projects coming within the jurisdiction of the Ministry of Industry. The TOT Policy under which the TTC will operate will be set by GOFI.

The Placement of Public Sector Enterprises

In evaluating any of the above Options, express consideration must be given as to how it will affect transfers of technology to the Public Sector. Since Public Sector enterprises dominate the industrial economy of Egypt, there is little point in developing legislation which excludes their responsibility or in creating decision networks which are inapplicable to them. Thus, any proposal for new legislation must envision the impact it should have on contractual acceptances by Public Sector units. It is recommended that, as statutory bodies, they must come within the purview of laws that govern contractual acceptances by the private sector. This is the situation, for instance, in India. Presently Law 21 is inapplicable to Public Sector firms. Law 43, too, is weak in that it only requires that 'projects' should be in national interest, not the contractual vehicles.

Central Board of Technology Transfer

The term 'Central Board' is used here to avoid any confusion with the objects and purposes of the National Board of Technology Transfer, which has been organised under the sponsorship of ASRT. Further, the concept of Central Board, as discussed here, is only applicable to the recommendation of this Mission that the TTC be organised as a central appraisal unit (see pp. 114 and 116-121) operating under the aegis of a TOT Policy (see second paragraph, p.122 and third paragraph, p.123), in turn developed in a multi-agency effort, namely, a Board.

It is recommended that the authority instrument for the TTC (to repeat - as central appraisal unit) should be a Central Board of Technology Transfer* which sets , in respect of technology agreements, a TOT Policy derived from considerations of the role of foreign technology in Egypt (Technology Policy-Section V). This recommendation arises from others (see second paragraph, p.133 and, Recommendation 4 of Section I) that the TOT Policy should have a wider purpose in Egypt than merely being directed to the quality of contractual arrangements.

It is recommended that the composition of the Central Board should be such that it reflects the views of all important organisations directly associated with the use of technology in Egypt. In particular, it is desirable that there be representation from ASRT, GAFI, the Patents Office, Trademarks Registry and from organisations and policy-groups associated with the development of small-scale industry. It is also recommended the Board should have representation from chambers of commerce and the stock exchange so that the view point of the Egyptian private sector is taken into consideration.

At the same time, it is recommended that the Central Board should have a forward-integrated technology - industry orientation rather than a science-industry or science-technology orientation,

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* Which Board may eventually become the National Board or be absorbed into it.

and that the Policy makers have a close working interface with those executing policy (the TTC). It is therefore, further recommended that the routine operations of the TTC should be guided by a sub-committee of the Board which is wholly composed of representatives of industry management (GAFI, GCFI, the Ministries of Health, Petroleum and Agriculture). Since the Open Door Policy favours the private sector and economic development through market forces, the sub-committee should have the appropriate bias.

SECTION V: TECHNOLOGY POLICY AND TTC */

GENERAL

1. To meet its objectives in the year 2000, Egypt plans to increase its GDP 8-fold over what prevailed in 1975, concurrent with the transformation of a quasi-agricultural society into an industrial one. The 'October Document' of 1974 clearly states that the "future of Egypt depends on industrialization". The Ministry of Planning has stated "the economic and social development of Egypt pivots on the development of Egyptian industry quantitatively, qualitatively and technologically. With this bias, underscored by Law 43 of 1974, it is very evident that the industrialization of Egypt will be promoted through heavy injections of overseas technology and investment.

2. At the same time, Egypt realises that the socio-economic structure of a developing country - which it is - can be severely strained and adversely affected if such technology is injected without discrimination or direction. Unguided, technology itself, as well as the terms under which it is acquired, can cause unacceptable distortions in society which may also become well-high irreversible. On the one hand, inappropriate and inconsequential technologies (or trademarks rights masquerading as technologies) may flood and imbed themselves in the country, and on the other, the cost of technology, or the controls imposed on the use of it, could commit the country to outflows of funds which can seriously endanger its balance of payments position.

Further, uncontrolled acceptances or technologies can increase, rather than decrease, the country's technological dependence.

3. It is also recognised that the progress of industrialization is demonstrably uneven, and of itself, can introduce new social tensions and imbalances. An industrial society, it is now becoming clear, cannot evolve without contemporaneous transformation of the socio-economic structure. To the extent possible, all industrial sectors of society must have activist roles in the production of goods and services and all elements of society should benefit from the application of technology.

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*/ Based on Working Paper II.

4. In recognition of these factors there is demonstrated desire in Egypt that proper policy instruments and institutional mechanisms should be devised so as to exercise selectivity in transfers of technology and guide technology flows into directions desired. The overall bias is, however, that technology transfer mechanisms must be promotional in character and not defensive in strategy.

5. To this end, and as one of its intruments, the Egyptian Government has proposed the formation of a Technology Transfer Centre (TTC). The tasks before the Government, on which UNIDO assistance has been sought, are:

(a) to define the roles and functions of the TTC
(b) to allocate a place for it the Governmental decision matrix and
(c) to recommend the policy framework under which it should function.

POLICY INSTRUMENTS

6. Surveying the scene, adequate mechanisms already exist in Egypt for carrying out sectoral studies for the evaluation of project feasibilities, and to some extent, technology selection. The information system is rather weak but this is being remedied.. Considerable capability already exists for the analysis of the production system and for rendering advisory services to entrepreneurs and to Public Sector units in the selection of machinery and equipment. Adequate capacity and capability are also present for project implementation.

7. However, the weakest links lie in the absence of technology-related policies and insufficiency of expertise for the evaluation of technology and its contractual vehicles.

8. Where adequate policy instruments exist, the operations of an organization such as a Technology Transfer Centre can be defined within a narrow framework. It could perform a specialist function as one cell of a multi-dimensional administration matrix. In such a case, its responsibility would basically be to ensure that costs of imported technology are reasonable and proportionate to its contribution, and that the recipient of technology has not accepted excessive limitations on his operations or incurred extraneous obligations.

9. However, in the absence of such perspective policy, mere acceptance of technology agreements on the basis of reciprocal relationships, or even from the wider viewpoint that national prerogatives should not be surrendered in the process of accepting foreign technology, may damage, through indirection, whole domestic

sectors of the economy whose needs and security are not protected by other policies.

10. In the flux of change that now characterises Egypt, it needs to be made certain that approvals of foreign contracts, whether involving technology alone, or it being accompanied by foreign investment, do not by inattention or disregard have unanticipated adverse impact on other sectors of the economy. Somewhere in Governmental administration, assessments must be made as to whether the introduction of certain types of technology will lead to disinvestment of existing industry or create unemployment, or like disadvantage, in some other sector of economic activity; and if so, whether the attendent effect is an acceptable default, or risk, in the larger national-political interest.

Assessment procedures should recognize that adverse effects (on other sectors) may not be created by the technology applied in the foreign-assisted production sector but could result from the acceptance of unguarded contractual terms in trademarks, market divisioning, and assertions under patent rights, etc.

11. The objectives set forth in Paragraphs 9 and 10 cannot be serviced by the TTC without adequate background policies, particularly a Technology Policy. Instruments as Law 43 and the October Paper provide direction but not body to Policy.

12. In this connection it would be worthwhile to include a conclusion in UNIDO's Industry 2000 - New Perspectives (1979), page 183:

"Whatever countries or groups employ modern technology as a tool of industrial development, must themselves elaborate technological strategies. Policies towards technology.... must recognise that technology, if it is to realize its unfulfilled promise, will only do so when those groups wanting to use it have a clear conception of why they are utilising it and what ends they hope to achieve".

13. In the Egyptian situation, the role to be played by technology appears quite explicit (...."the economic and social development of Egypt pivots on the development of Egyptian industry quantitatively, qualitatively and technologically" - Paragraph 1). Had it not been so, a technology policy could perhaps be constructed to directly reflect the 'technological content of national policies and objectives'; that is, the technical purposes sought in the transfer and development of technology. For the case in hand, technology policy in Egypt can be nothing less than a mirror reflection of its social aims. It is also social policy.

14. Ideally, for its purposes and framework, technology policy would require the clear articulation of national needs. Very few countries, if any, can be explicit in this regard because of economic factors and pressure groups. In the practical sense, therefore, technology policy is essentially an expression and the elaboration of strategies which divide, integrate and associate sectors of the economy influenced by modern technology.

15. Technology policy is not an extraneous injection. In any directed or planned economy, whether recognized as such or not, some policy is at work signifying uses to which technology is being put. Where this can be identified, technology policy manifests itself.

16. In the discussion attempted here, it is feasible to only indicate the large factors in forming technology policy. The more direct objective is to define those considerations which must guide the evaluation of contractual conditions in transfers of foreign technology to Egypt so as to meet the purposes set forth in Paragraphs 9 and 10. These considerations would be spelt out in a Transfer of Technology Policy (TOT Policy), the immediate and precedent policy that defines and controls the ambit and operations of a TTC.

TRANSFER OF TECHNOLOGY (TOT) POLICY

17. The TTC obtains its charter from addresses to questions as to whether foreign technology should be the primary tool for development of industry or whether it should have a 'residual role' - after exhausting prevailing domestic alternatives to technology; or if they must co-exist, whether they can co-exist, and under what conditions; and the impacts of such choice on the technology already being employed in the country, on local centers working on the development of technology, and indeed, on its internal transferability.

18. And second, the capacity of a nation to absorb and utilise technology, and particularly foreign technology, must be reckoned with. Some economic sectors of the country, like the Public Sector, may have the capacity to absorb large injections of hard technology; others, like the small scale sector, may not benefit at all from modern technology. Consequently, this consideration must be taken into account in guiding technology flows.

19. Correspondingly, institutional structures must be created in order to implement such policy. For the regulation (or channelling) of foreign technology a specialized agency is a sine qua non since international transfers of technology have bequeathed a new 'knowledge system', application of which requires multi-disciplinary skills. Thus, technology policy must delegate to this agency (the TTC) the role and functions of channelling of foreign transfers of technology.

20. In the Egyptian system of governmental administration, project approval authority is decentralized - that is, final decisions on the acceptance of technology (the technical means to be employed in a project), and of the contractual terms under which it is offerred, are with GAFI, GOFI and several Ministries. Therefore, TTC alone cannot implement the TOT Policy.

21. It has therefore been recommended that:

(i) TTC should act as a recommendatory secretariat assisting and advising project approval authorities in the appraisal of contractual obligations in transfer of technology contracts, and

(ii) TTC, as well as project-approval authorities, should jointly subscribe to a common policy which will define the general terms for the acceptance of foreign technology into Egypt, i.e. TOT Policy.

Thus, the ambit of the TOT Policy is quite significant.

22. Since a specific TOT Policy for Egypt cannot be developed until the overall technological strategies are framed and structured. This Paper developes a draft interim TOT policy on the basis of the general experience of developing countries modified by readily apparent features of the present socio-economic environment in Egypt. (Some considerations in the latter text permeat the balance of this Section).

CONSIDERATIONS IN TECHNOLOGY POLICY

23. The forthcoming discussion only pays 'lip service' to the technical purposes which should be served through technology flows. This is a task for planning organizations once technology policy, to which they would have subscribed, defines the uses to which various categories of 'technology systems' should be put. The major focus here, is on management functions in the 'transfer of technology process.'

24. No developing country has thus far presented its technology policy in explicit form. Thus, models are not available. However, in the case of India, some of its policy instruments are clearly established. Appendices to this Paper depict them briefly. In some of the concepts developed here, this Consultant has drawn on the Indian experience.

25. Planners in a developing country must seek answers to the following:

a) What goods should the economy produce? - heavy machine tools or bakeries ?

b) For whom are the goods meant ? - for low-income groups or elitist society ?

c) Who will produce the goods ? - the small industries sector, joint-venture sector or other ?

d) What thrusts are necessary in the use of resources (in the widest sense of the term) ? - foreign technology, foreign exchange or labour ?

These are, obviously, parallel questions of equal weight with their answers interactive and interdependent. The technology planner cannot take a 'back-seat', wait for other planners to excercise their options and then seek his role in the 'technological content of objectives and policies'.

Technology policy cannot stand isolated from social issues. */ For illustration, it may be a viable strategy to have cheese made for low-income groups through joint-venture enterprises, using foreign exchange earnings as the resource to service profit repatriation.

But then, cheese-making involves machinery, and cheese itself, needs to be packed in plastic, transported in trucks and distributed from cold storages. With the constraints in a developing country all these requirements cannot also be met through the joint-venture mechanism. For one requirement, the cost of direct licensing might be more favourable than the costs and obligations of a joint-venture; in another, foreign technology may reduce prices but bring no other

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*/ In fact, it has been demanded of technology that it should be addressed to the "poorest of the society" ("World Plan of Action for Application of Science and Technology to Development and the Regional Plans"). United Nations E/AC,5.2/XXI/CRP.13, (1975)

advantage to domestically - available technology. While making these choices it is necessary to ask whether or not technological dependence might deepan. If so, what penalties would have to be paid and who will pay them? (That is, what is the social consequence)? This must lead to another question as to whether or not such adverse social consequences could not be redressed, or alleviated, by spreading the 'technological load' over the overall production system.

26. If the latter approach has meaning, as it appears to do in developing countries, then technology policy must absorb the task of outlining the strategies which, in the interplay of economic, commercial and regulatory forces, will:

a) Allocate sources of technology (the joint-venture, licensed transfers, local technology) to the 'users of technology' (the Public Sector small-industries sector, etc) in the context of equity and appropriatenesss;

b) ensure that the weaker sectors (as the small-industries sector) maintain, and to not lose, their viability by unrestricted exposure to competition from other sectors;

c) upgrade overall utilisation of technology by conscious development of capabilities in national managers and engineers;

d) reduce technological dependence on overseas sources by internal transfers of technology, including that from the laboratory to industry, and

e) stimulate local innovations and domestic developments of commercially competitive technology.

Except for the emphasis on the 'allocation' element in the use of technology, which is the recommended charter to TTC, the management role described here has close parallel to that formulated by Dr. O.A. El Kholy in "The Structure and Functioning of Technology Systems in Developing Countries" UNIDO ID/WG.301/2 (June 1979).

27. Technology policy is, however, not industrial policy, although they are dynamically interlinked and co-exist. Industrial policy aims at the production system and the placement of human and material resources in a regulated system of production and distribution of goods and services. To achieve its objectives industrial policy seeks to create an infrastructure through vertical and horizontal integration of related and interdependent activities.

Technology policy, on the other hand, is oriented to strategies for achieving desired balances in the social sectors which technology is meant to serve. Technology policy seeks to create a superstructure which can bring about the horizontal integration of dissimilar elements and forces influencing, and influenced by, technology.

USERS OF TECHNOLOGY

28. With this perspective, it becomes possible to investigate the main parameters on which a technology policy can be constructed.

29. In Paragraphs 40 to 94 an attempt has been made to identify the role that can be played by technology in the development of the economic sectors (the allocative task). For this purpose, four economic sectors have been chosen: (1) the joint-venture sector (2) the Public Sector (3) the large-units' Private Sector and (4) the small-units' Private Sector (defined, not as in the Egyptian context of units employing less than 10 people, but as an arbitrary division of the total private sector, employing modern technology). No particular focus is brought to bear on rural and village industries since they are seen, in this study, as only the beneficiaries of modern technology and not as its direct users. They participate in cost-free transfers of technology which occur when technologies degrade into techniques and diffuse into the economy.

30. Because of its bearing on the TTC, much of the discussion revolves around contractual conditions that must be present in technology agreements so as to achieve the objectives discussed in Paragraphs 9 and 10. Basically, the strength of the "source of technology" should be fully exploited while making sure that the roles of the sectors, particularly the small-units' sector, are not hurt or hindered through inattention in collaboration agreements.

31. Such analyses, combined with considerations on the 'technical purposes' for which technology is sought (i.e. products of the economy), should enable technology strategies to develop 'source-user' matrices. The outline of a matrix is presented in figure XIII. India's position on the large-unit's private sector is given in the following list and figure XIV as an example.

32. Strategies to ensure the protection of the weaker sector are covered in Paragraphs 38-39, 75-79 and 92-103.

Figure XIII. SOURCE-USER MATRIX IN TECHNOLOGY POLICY

SOURCES OF TECHNOLOGY	USERS OF INDUSTRIAL TECHNOLOGY							
	Public Sector	Large-Units' Private Sector	Small-Units' Private Sector	Village and Rural Industries	Backward Area Dev.		Export-based (Inland) Industries*	
					Public Sector	Large-Units' Private Sector	Public Sector	Private Sector: LUS / SUS
Transfer of foreign technology through investment - JV								
Transfer of foreign technology without investment							1. Preferred Industries 2. Supporting Policies	
Lateral (Internal) Transfers of Technology		1. Preferred Industries 2. Supporting Policies						
Technology Transfer from Laboratory to Industry								
Enterprise - Developed Technology	1. Preferred Industries 2. Supporting Policies							
TCDC Mechanism				1. Preferred Industries 2. Supporting Policies				

TCDC= Technical Cooperation Among Developing Countries

JV= Joint-Venture

LUS=Large-Units' Sector

SUS= Small-Units' Sector

* Excludes Free Zone Enterprises

India's Policies re Large-Units' Private Sector (Industry)

1. The basi bias in India's industrial development policies is regulatory.

2. Indian Private Sector is excluded from establishing, or participating in, defined nationally-sensitive projects (armaments, nuclear energy, etc.).

3. Other than rationalisation needs in existing Private Sector units, all new investment in defined categories of industry will be the exclusive area of the Public Sector (electric power, steel, mining of major ores, aluminium, etc.).

4. In a defined category of industries, the Public Sector will co-exist with the Private Sector and will gradually establish dominant position (fertilisers, petrochemicals, etc.).

5. In all other categories of industries (undefined) and products (undefined) the Private Sector shall have the complete domain, unless public interest is threatened.

6. The Government has taken no position on industrial consultancy services; both the Public and Private Sectors can be active.

7. As per the Indian Companies Act. 1956, and the IDR Act, the Government reserves the right to 'take over' production facilities of large firms (defined in terms of assets) if mismanagement is suspected and if it is in the public interest.

8. The large-units' sector, as companies incorporate, is excluded from manufacturing products which are wholly reserved for the small-scale sector (some 850 products). The latter sector is defined in terms of investment. Large units producing such products before the reservation (circa 1977) can continue to do so but will not be permitted to expand, change location, etc.

9. For a defined list of products and industries, all companies in both the Public and Private Sectors (but excluding small-scale sector) must obtain Industrial Licenses which endorses capacity, location and product-mix.

10. All contracts for foreign technology must be approved by Government even if there is no payment involved. (When a small-scale unit licences technology, it must also obtain the same approval from Government. The same applies to Public Sector units).

11. Industrial licensing for all products (except as covered in Item 2 above) is centralised within a single unit of Central Government. The same body has sole authority for approval of technology contracts (or any agreement relating to industrial production or services entered into with non-Indian parties).

    The approval of foreign investment (in projects) is with the Foreign Investment Board. This Board also supervises technology licenses. Foreign technology cannot be capitalised.

12. All payments for technology or technology services must be effected through The Reserve Bank of India who may examine agreements to determine allowability of remittances. The Reserve Bank of India is also the single channelling body for profits, dividends, capital repatriation, etc.

13. No specific instrument controls joint-venture investments. All new foreign investment is regulated so that foreign equity in Indian enterprises is below 40%. Exception is given to '100% - export' projects (when 100% equity is theoretically possible).

14. Large units above a certain size (or belonging to 'Big Business Houses') */ will generally not be permitted to engage in 100% forward-integration. A certain amount of production must be sold for conversion by the small-units' sector. (Thus, a producer of plastics resins can convert only 25% of his production to plastic end-products as film or pipe). Big Business Houses will not be permitted to engage in consumer non-durable products.

15. The Government periodically publishes three lists:

    (1) industries and products in which foreign investment is permissible
    (2) products/industries where foreign investment will (ordinarily) not be permitted, and
    (3) products/industries in which neither foreign technology nor foreign investment will be permitted.

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*/ Defined under the Monopoly and Restrictive Trade Practices Act.

16. Sole supplier or sole distributorship agreements in companies above a certain investment level are not permitted by the Government except with its permission (Indian Companies Act, 1956).

17. All companies are encouraged to laterally transfer technology. To aid this, 40% of all income from sale of technology and technology-related services are free of income-tax.

18. Export of technology and services is encouraged. 100% of all income from such exports is free of income tax.

19. All companies are encouraged to do R & D. 100% of all expenses (of capital or revenue in nature) are expensable against income in the year of expense If R & D results are utilised by the company, an expense at 120% of capital cost can be deducted from gross taxable income. In addition, normal depreciation can also be charged. Sale of R & D results obtain the concessions of (17) and (18).

20. The right to sublicence technology must be incorporate in all licensing agreements.

21. The Government encourages, through tax concessions, wide diffusion of equity with the general public.

22. The appointment of Directors in very large firms is supervised by Government. The appointments of Managing Directors must be approved by Government.

23. Companies in which foreign investment is higher than 40% cannot diversify, expand, reduce capacity, change management, acquire new firms, raise private or public loans, acquire new technology, extend Directorship, provide consultancy service, trade in products of third-parties, import and sell products and equipment, change capital structure, dispose of property, acquire real-estate, open branch offices, etc. without the specific approval of the Government through authorised agencies.

24. Government encourages multiple production units. Companies will be permitted expansion only to reach economic viability. Thereafter, further production will have to take place at a different site.

25. Geographic dispersion of large units is encouraged. Units located in 'backward areas' can produce certain goods which would not be otherwise encouraged. Location in backward areas is facilitated by tax concessions.

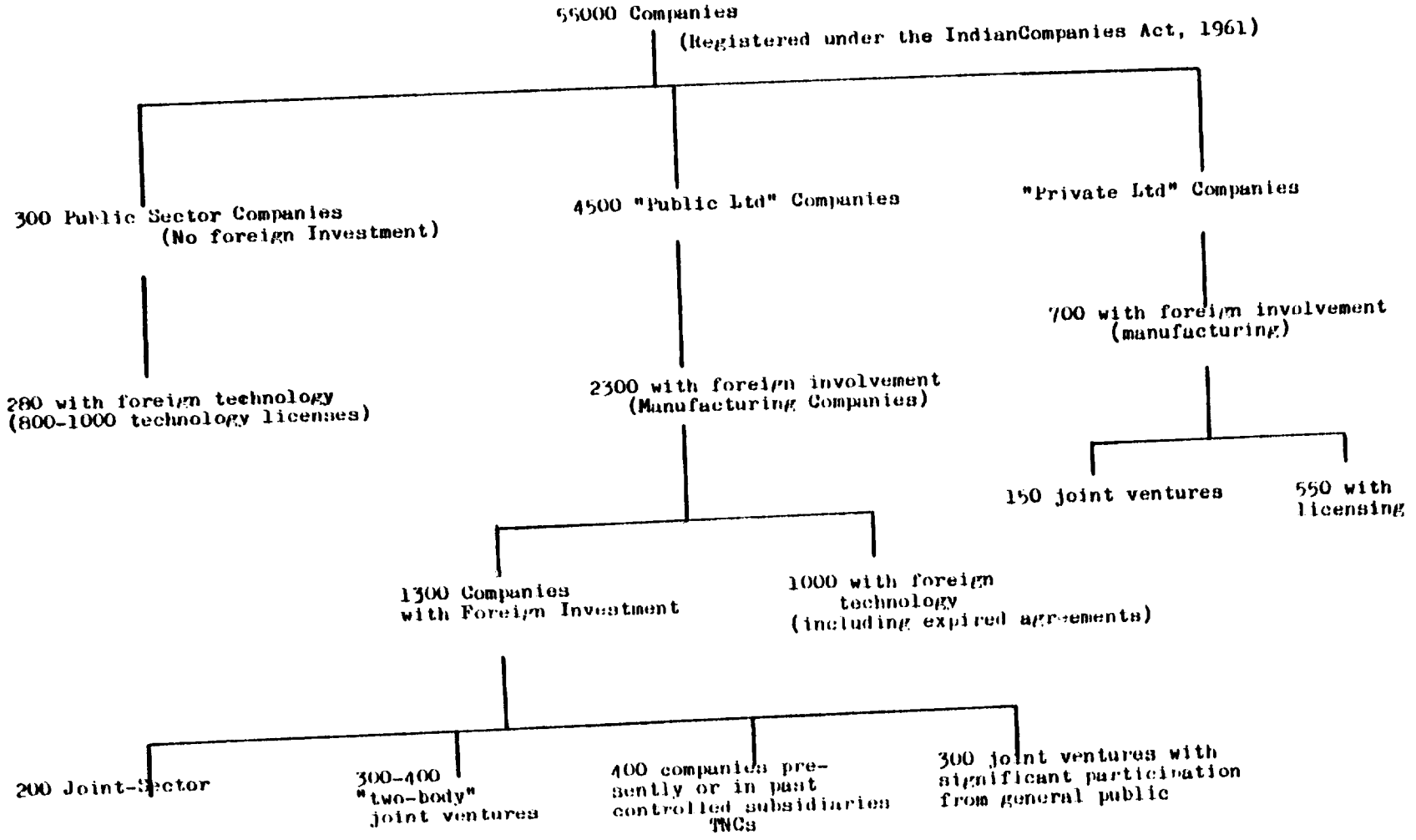
26. Companies using different foreign partners must establish different companies.

27. The foreign equity of an Indian firm cannot be transferred to another foreign firm without the approval of Government.

28. Companies in which foreign investment exceeds 40% will not be permitted to make consumer products.

Figure XIV. FOREIGN PARTICIPATION IN INDIAN INDUSTRY*

(see also table)



*Source: Private Assessment
Arni Hy-Tech Consultants
New Delhi, India.

TRANSFER OF TECHNOLOGICAL CAPABILITIES

33. In many developing countries, the transfer of technology is viewed as essentially the 'transfer of capacity' - a straight forward form of import-substitution. As soon as the transforming instrument (production system) - which converts raw materials to products - is situated and is operative in the national territory, it is assumed that the transfer of technology (or of know-how), is achieved. A developing country is ill-served by such a concept.

34. A technology transaction should serve more than this function. It should transfer capability. It is a right that must be claimed from the transferor and set down in the contractual document. Transfer of capability is not merely training on how to run or maintain a plant, or even how to meet cost and quality targets. Capability is achieved when (a) the technical skills to manage manufacturing sequences, the knowledge skills to expand, change or diversify production, and the organizational skills to manage the enterprise are in the hands of local managerial personnel, and (b) when techniques of the production system percolate to the engineers, technicians and operators through the purposeful creation of absorptive power within the enterprise.

However, transfer of capability is completed only when (i) the decision-making powers to expand, change or diversify the production scheme are those of the national managers of the enterprise and (ii) the rights of the domestic enterprise to seek and diversify markets are not unreasonably constrained by the supplier of technology.

35. In unregulated, or ungoverned, transfers of overseas technology, the above referred decision-making powers are often in the hands of the transferor of technology by virtue of the management control granted him (for instance in a joint-venture), or the above-mentioned rights of the local enterprise are often curtailed by the supplier of technology through misuse of his powers (over-extended obligations) under grants of patent and trademark rights and exclusive reservation of markets for himself.

Capability is not granted. It must be wanted. It should be part and parcel of technology policy.

VALUE-ADDITION CONCEPTS IN TECHNOLOGY POLICY

36. One of the basic objectives in employing foreign technology is to increase value-addition. This is important in both the import-substitution and export sectors. The ensuing discussion relates basically to implications in the import-substitution area.

37. Mere assemblies of products in the mechanical/electrical industry, or formulating/compounding in the 'process industry' do not imply use of technology even when products are meant for mass marketing. */ 'Technology agreements', in these areas, are often cloaks for merchandising of trademarks and market rights (i.e. they confer 'exclusive supplier' status on the local enterprise).

38. Consequently, developing countries need to scrutinise collaboration agreements to ensure that local firms will contract for 'hard' technology; in essence, value-adding technology. The right to make, and the capability to make, major components of the candidate product system are 'technological objectives' that must be present in licensing arrangements.

39. Likewise, collaboration arrangements have to be scrutinised to see that value-addition, which should properly belong to the enterprise, are not diminished by commercial contrivances. For example, if one of the partners to a joint-venture is a sole seller of the firm's major inputs, and the other partner the sole distributor of its products, it is possible for pricings of input and output to be so manipulated that the firm exhibits so low a value-addition that the technology applied appears inconsequential.

40. However, value-addition at the level of an enterprise should not be so pursued or rewarded that it negates the consideration that a part of the value-addition could be made to occur at a point outside the enterprise at a lower cost, in real or socio-economic terms. For example, to take an extreme case, it would be inappropriate to reward a technology supplier because the licensee enterprise will make all the bolts it requires for the manufacture of a refrigerator. A firm already in the business of making fasteners may be able to supply the bolts at a lower cost, or more importantly, in a developing country, its production could be delegated to the small-units' industry sector for socio-economic considerations.

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*/ Management systems are of greater relevance.

41. Concepts in value-addition are expressions of technological strategy. To the extent that social policy requires balances among the production sectors, inter-sectoral subcontracting should be considered an important mechanism. Thus socio-economic purpose would be served when a public sector enterprise (itself a socio-economic concept), in conscious exercise, delegates out, manages and supports value addition in the small-units' sector. (See Paragraphs 93-94). Likewise, the divisioning of 'downstream processing capacity', referred to in Paragraph 77, is an exercise in the delegation of value-addition.

42. When an enterprise undertakes 'backward integration' towards raw materials, or 'forward integrates' towards markets, it is, in national terms, an expression of value-addition (so long as the integration is through the injection of technology). From the viewpoint of the 'allocation' exercise in technology policy, it is important that proper instruments be chosen to ensure that these integrations can be achieved (eventually). In this respect, joint-ventures with TNCs offers the best scope because of their wide portfolios of technology (see Paragraph 61). However, while such integrations must be favoured (contractual provisions), those of 'vertical' and 'horizontal' integration must be disfavoured (via Company Law), for while they add value at the level of the enterprise, the national system does not gain perceptibly nor is socio-economic justice served. (These integrations occur through acquisitions of firms either in competition with the enterprise - horizontal integration - or those of its suppliers and distributors - vertical integration).

THE ROLE OF JOINT-VENTURE SECTOR IN TECHNOLOGY POLICY

43. Properly wielded the joint-venture sector can contribute a great deal more to a developing country than merely being a local source of high quality goods, or a source of technology or capital. Improperly weilded, as the experience of many developing countries has amply demonstrated, it can weaken or distort the socio-economic fabric of a country, increasing its technological dependence. The dimensions of the factors steeply escalate when transnational corporations (TNC's) have a significant presence.

Role of TNCs

44. The TNC's are enormously potent devices for obtaining access to modern mass-production technologies; for developing vast distribution networks; for exploiting resources of marginal value; for obtaining access to highly organised international markets which are monopolised by them through patent coverage, trademark tradition and market divisions; for management techniques that confer high quality on the human infrastructure of their organisations, and through it, vast efficiences in the use of resources; and, of course, for attracting capital into risk environments.

45. The eulogy of the last paragraph would be more honest in the context of investments in industrialised countries rather than investments in a developing country. The general impression of TNC contribution to developing countries can be gleaned from the following quotations:

46. "For reasons of their own corporate objectives, TNC's have not contributed significantly towards solving developing country problems of poverty, unemployment or the satisfaction of human needs". (p.14 "Industry 2000 - New Perspectives", UNIDO, 1979).

47. "Studies of management behavior in TNC affiliates show that the major enterprise decisions are taken in the head offices of the corporations, including those involving investment planning, budgetting, personnel appointments, usually avoiding interference from both home and host governments". (Ibid, page 84).

48. "....the activities of transnational corporations should be subject to regulation and supervision in order to ensure that these activities are compatible with the development plans and policies of the host countries ...." (Paragraph 42, Lima Declaration, March 1975).

49. Despite this caveat, it is well recognized that in a world of increasing international dependence, the growth of developing countries is highly dependent on the use of TNC investment and technology just as the growth - or even the stability - of the developed countries is dependent on the resources and markets of developing countries.

50. All this only illustrates that national enrichment through foreign technology and investment must be gained in a framework of conscious choice. Technology policy can contribute to this direction.

51. The above discussion is very significant in the Egyptian context in that the joint-venture sector, while rapidly growing in size, is yet a new sector. TNC's or foreign companies do not now have substantial local presence, or local lobbying power, which they can exercise to adversely influence proper policy choices. Further, today, where the joint-venture exists, it is largely in collaboration with Public Sector enterprises, which can be considered collaboration under the 'watchful eye' of Government. Additionally, there is some relief in that Egyptian Law does not permit free-standing foreign industrial enterprises with wholly independent management rights. All these factors are in favorable constellation and uncommon to most developing countries. Thus, the capacity to wield the joint-venture sector to fulfill national interest is present in Egypt.

52. Most importantly, the joint-venture sector must be established in a balance of forces. The capital-and-technology input of the foreign partner is not to be weighed, in the national context, against profits to be made or taxes collected, but against the national market-and-resource opportunities and rights offered to him. Technology policy must perceive this balance.

The 'Balance' in Technology and Development Agreements

53. The first implication to technology policy (directly transmittable to the TOT Policy), is that the rights of the foreign partner through the investment he makes should not dominate or determine his rights over the technology to be supplied, the impositions he can place on the use of technology, or the obligations that must be accepted by the domestic enterprise. The investment agreement (the Founders' agreement), and the technology agreement, must be separate legal documents co-equal in the eyes of Government and of same status. They must not only be internally-consistent agreements but their accountabilities must be separate. This is international practice.

54. Further, since the two agreements are of equal status, approval of one should not imply, or determine, the approval of the other. Only when each is independently acceptable should the joint-venture instrument come into being. Fundamentally, it is the foreign venture partner who requires that his returns from investment (dividends) should be considered separate from the returns he obtains from the use of his technology (royalties). Thus, the thesis here, on the equal status of the agreements is merely a restatement of reciprocity.

55. Nothing in this procedure implies that the sources of investment and technology should be separate. While not inconceivable, the usual joint-venture would use technology and investment from the same source.

56. Giving equal status to the agreements does not preclude giving one agreement a higher priority than the other. If investment is the greater need, more must be given for it (such as greater control in management matters), and vice versa for the technology contract. It follows from this criterion of the 'balance of agreements' that explicit logic does not exist for the benefits conferred through investment to be automatically offset by obligations imposed on the use of technology. These extraneous counter-balances are, further, legally indefensible. The only reason that one associates the two agreements is that their signatories are the same. Consequently, failure to agree on one agreement frustrates the other.

Transfer of Management Capabilities - The Management Service Contracts

57. The second implication to Technology Policy is that the joint-venture should serve the purpose of transferring capabilities to the local enterprise. The investment agreement is not a mere statement of the financial relationships between the parties to the contract. There is implicit requirement */ that efficiencies must be obtained in the use of capital: the overall capital, the capital of the contributeries, and importantly the local and foreign capital that the nation allocate (through the planning process) to the joint-venture sector. Equally, the technology accepted through the technology agreement must achieve efficiencies in the use of the scarce physical resources allocated to the enterprise.

In effect, the joint-venture instrument must transfer to the local enterprise management and technological capabilities.

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*/ Nothing bars its explicit expression in the agreement!

58. In respect of management capabilities, either there should be some commitment from the foreign investor that he will create an apparatus in the enterprise for the conscious development of local personnel, or a demand must be placed on him to create this apparatus through a separate and financially compensated "management services agreement".

59. Management efficiencies must ultimately REFLECT in the use of smaller working capital, better usage of inputs, lower wasteages, timely assessment of developing faults, resilience to cater to the ups and downs of the business environment, reduced plant breakdowns, capacity utilisation, etc.

60. The need of management capabilities is not a need of the abstract in the Egyptian environment. All discussions have indicated that Egypt has real and serious deficiencies in this area. The joint-venture, thus, should be the chosen instrument for fulfilling this need. The requirement in Technology policy is that the joint-venture should be most prevalent, and therefore, the foreign venture partner best compensated, in those sectors of the economy, or product areas, where the need for management efficiency is the greatest.

61. However, while individual TNC's have wide portfolios of technology highly desirable in the developing country (such as those for basic chemicals capital goods and industrial intermediates) they prefer to invest in consumer goods ('nearest the consumer, highest the profit') whose production systems and technology, in the form they are transferred, are, in the eyes of developing countries, highly simplistic or low in value-addition. On the other hand, when transfers of technology are sought for industrial intermediates, etc. they are offered in the form of licensing agreements, unaccompanied by foreign investment, and often under terms which are adverse to the developing country (at least over the short-term). The correction of this situation is, of course, a challenge in technology policy.

The Structure of a [illegible]agement Services Contract

62. Since this type of contract is uncommon in Egypt, while discussions have indicated that they would be desirable, the following is a brief introduction to the subject.

63. Where there is no formal management service contract, the transfer of management knowledge occurs casually and to the extent that foreign counterparts take personal interest in developing their 'understudies'. This is an inefficient process. A management services contract forces the pace. It stipulates the time period over which absorption should occur, the number and the qualifications of the foreign personnel who would be in the management team of the joint-venture enterprise, the compulsory association of national counterparts with each management function (purchasing, factory accounting, sales administration, etc) and the proposed schedule under which foreign professionals withdraw from the enterprise.

The service contract would classify management areas where transfers of knowledge would be required:

- establishment of policy manuals i.e. financial reporting;
- annual sales and production budgetting;
- production scheduling;
- purchasing procedures and purchase appraisals;
- works accounting, standard costs and variances;
- inventory control;
- auditing procedures and standards;
- personnel policies, appraisals, planning;
- insurance policies and objectives;
- financial and cash/flow management;
- cash-credit procedures, manuals, objectives, controls;
- product distribution management; discount pricing;
- market and sales forecasting techniques;
- consolidation into management information systems, etc.

Transfer of Technological Capabilities

64. Thus far, the association between the transfer of capital (investment) and the transfer of managerial capabilities has been discussed. A similar relationship must be made to prevail between the transfer of technology (the technical means to manufacture goods) and technological capability. This is not merely the capability to operate a plant to its designed capacity or the skill to maintain product quality - the usual objective of "training programme". (See paragraphs 33-35).

65. One major disadvantage of the joint-venture concept lies in the practicability of the local enterprize achieving the above-mentioned transition of rights. So long as the enterprise is controlled by management rights vested in the foreign venture partner, decision powers are unlikely to move to the national enterprise. Where such transfers (in technology policy) are important, as would be, for example, in the basic goods industries, a local venture associated with a straight licensing agreement, or a joint-venture unit with minority foreign investment, would be preferred.

Other Considerations in Joint-Venture Concept

66. Technology policy, in assigning a role to the foreign-technology-assisted sector, should encourage a selection process wherein the total potential technological capability of a candidate foreign firm is tested. For example, preference should be given to foreign investors who have a wide 'mix' of technologies so that success in the first venture might become an inducement for new product introduction; or that such success might be inducement for backward and forward-integration in the local enterprise.

67. The joint-venture mechanism should also be used as a 'seeding device' so that the technological capabilities achieved by the people of the enterprise can be transferred to other enterprises within the same ownership system. To wit, a Public Sector unit making cement in a joint-venture agreement must be able to set up, at other locations, in facilities under its ownership, other cement plants so long as royalty payments to licensor cover the new production. This implies, first, that Public Sector units are adequate vehicles for the multiplication of production units on a common technology base, and second, that contractual material governing the initial technology agreement must provide facility for such multiplication without let or hindrance so long as proportionate royalties flow to the owner of technology. Further, contractual arrangements must be explicit in that such new production will not be under the ownership, in any form, of the foreign venture partner.*/

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*/ This emphasizes the need for the separateness of the investment and technology agreements.

68. In concluding this part of the discussion it might be noted that the TNC would generally prefer to invest and operate in a country where a formal national technology policy and economic logic exists than in a laissez-faire economy in a politically undetermined system. This factor is specifically highlighted in "Foreign Investment in Egypt" (Driscoll, R.E. Hayek P.F. & Zaki, A.F.), Fund for Multinational Management Education (1978, New York).

THE ROLE OF THE SMALL UNITS' PRIVATE SECTOR IN TECHNOLOGY POLICY

69. In the Egyptian industrial structure there are very few medium-size plants in the Private Sector. Production is distributed between thousands of very small Private Sector units and about 200 large Public Sector units. The small units have a dominant position in areas as printing, wearing apparel, wood, furniture and leather, or divide the market, in about equal proportion, with the public sector in areas as processed food, metallic and 'non-metallic' products. In industrial intermediates as chemicals, rubber or paper, and in consumer products as textiles, tobbaco or beverages, the Public Sector contributes to over 90% of production.

70. For correcting this lop-sided distribution, specific policy instruments are being devised in Egypt. The Open Door Policy itself has led to the introduction of a substantial number of medium-sized firms which may be considered as belonging to the 'modern small industries Sector'. Presently, these units are not under any specific institutional umbrellas, work in a competitive environment and employ machine-embodied technology.

71. The focus in the forthcoming discussion is to briefly consider what mechanisms, and particularly what technology-oriented mechanisms, can be employed to develop a MODERN Small-units' industry Sector from the viewpoint of social policies. In this discussion, the privately-owned-and-managed manufacturing industries Sector is arbitrarily divided into two sub-sectors: The Large-units' Private Sector (See Paragraphs 82-91) and the Small-units' Sector, so as to see how technology is applied in them and how technology policy can be shaped to approach them. (The Egyptian definition of small-scale units as having employment levels below 10 persons has no bearing in this discussion).

72. The modern small units' Sector has important implications in social policy. There are three large factors. First, it serves the socio-economic purpose (Paragraph 74). Second, by employing the methods of modern industry, and modern technology, it achieves resource-efficiencies in the use of scarce resources (energy, foreign exchange, etc. as the case may be). Third, modern technology permits this sector to eliminate or minimise market segmentation that would otherwise occur through variations in product quality. However, in the economic context, since it would be producing the same goods as the large-units' Sector, it would suffer from the economics of scale. This must, therefore, be counter-balanced by Government intervention in, and integrative management of, the small-units' Sector. Technology policy, to the extent possible, must fulfill this obligation.

73. The large-units' Sector is distinguished by comprising of 'free-standing' risk-bearing enterprises which, by economies of scale, will be viable in the domestic competitive environment without dependence on close policy support or institutional mechanisms as 'industrial estates', etc.

74. In the developing country, the small-units' industry provides many socio-economic benefits and outputs besides its demonstrated capacity to increase employment : (1) it is a viable mechanism for creating entrepreneurs and building entrepreneurial skills, nucleii for the large-units' industry (2) it is an instrument to convert traders of industrial goods into manufacturers thereof (3) it is a modulating and linking device between industry and agriculture and an efficient specialized device for utilizing industrial and agricultural by-products and wastes (4) it is groupable with the agricultural sector to sustain rural economy or to stem urban migration (5) it is highly dispersable, and becomes highly innovatable (with respect to needs of low-income groups) with the support of institutional instruments, and very significantly (6) units of the sector are highly replicatable, thus aiding multiplication and dispersability.

75. Such socio-economic benefits, of course, have to be counterbalanced by socio-economic costs. These manifest themselves both in the need to have costly inter-ventionist mechanisms and through the introduction of inefficiencies, distortions and disturbances in and to the general economic-industrial structure. The small-units' Sector, in effect, is an intruder who spoils the harmony of conventional industrial society.

76. More than in any other segment of the production system, technology concepts and strategies to service this sector must have strong linkages with equivalently-oriented market, fiscal, tarriff and credit structures. The objectives of all policies in this area would not be to minimize or eliminate these 'inefficiencies, distortions and disturbances' but to anticipate, control and contain them. Further, the small-units industry is unlikely to be a transient stage in the economic evolution of developing countries. Therefore, policies and mechanisms have to be considered in the framework of a permanent structure.

77. Thus, technology policy must obtain its mandate by looking at the several mechanisms that can be used (and are elsewhere used) to sustain the small-units' sector alongside a large-units' sector. Important among the mechanisms are:

i) Market-reservation: efforts to divide markets by wholly reserving certain ranges of products for the small-scale sector (as in India - see Appendix); by allocating geographic areas backward areas' for large-units); by preferential subcontracting or purchasing (e.g. the Public Sector buying certain goods only from the small-units' sector or at higher prices); by 'rationing' down-stream processing (e.g. permitting producers of basic industrial intermediates say, detergent or pesticide bases,or wire-drawing billets, to forward-integrate into compositions, formulations, wires, respectively to only a fixed percentage of their productive capacity - thus compelling them to market the balance of (intermediates) capacity for conversion by the small-units' industry); and the like.

ii) by market-segmentation: permitting both the large-units' and the small-units' sectors to participate in the same general product area but limiting range. For example, by limiting certain sizes of refrigerators and washers to the large-units' sector and allowing the other sector to produce the non-limited range. Or, by reserving mini-oxygen, mini-steel (arc furnace steel) mini-paints and such projects to the small-units' sector while allowing the large-units to only exist in certain locations so that distribution economics favour the small units (See Paragraphs 100 and 101).

iii) by manipulating marketting and distribution mechanisms: disallowing use of foreign brand names on products of large producers; permitting franchising; disallowing exclusivity in supplier-dealer relationships which prevent dealers from handling the same product from more than one company; by the State undertaking to advertise the products of small-units' industry (i.e. lowering its marketting costs), etc.

iv) by technology differentiation: by disallowing large units from using certain types of technology (example, plastics extrusion); by means of making 'technology cost' higher to the large manufacturer (e.g. by imposing export obligations on him) or by creating 'buy-back' obligations on the technology supplier; by persuading two or more companies to aquire the same technology from the same supplier at the same time (the compulsion to share the market- reduces the size of the firms), etc.

v) by preferential tax and tarriff incentives: to the small-units' producer; by special subsidies, etc. and

vi) by the state absorbing the cost of infrastructure for the small-units'sector by creating (industrial estates', etc.).

78. In all of the methods discussed above, there is no implication that technology per se should be degraded, made more appropriate, or adapted to suit the small-units' industry as would otherwise be necessary for small units outside the modern small-industries sector. Nor is there any implication that foreign technologies would be unsuitable for the small-units' sector. There is only the explicit implication - rather, requirement - that the 'external economy' of the small-units' sector should be creatively manipulated to favour it.

79. Many of the suggested differentiations can be effected in Egypt at the time of issuing Industrial Licenses or in the process of approving technology contracts of the large and small units. Technology policy, of course, should indicate preferred mechanisms and priorities.

80. Before concluding this discussion, some reference needs to be made to the desired relationship between the small-units' sector and agriculture, through 'agro-industries'. From the socio-economic point of view, or the 'pure-economics' viewpoint, the siting of small units in proximity to medium-sized farms, or farm co-operatives, has obvious merits. Technology policy, by its directives to the mechanisms employed for approving technology contracts, can favour the affinity.

It is to be noted that: (1) the technology used in agro-industry is basically machine-embodied and/or technician-embodied, there being little of 'secret' know-how (2) there is little risk in the 'performance of technology' - its application or its working can be witnessed in parallel operations (3) patents, if any, are of doubtful validity (4) there is a diversity of sources of technology, including

those in other developing countries, and (5) product specifications are not narrowly defined and exist in a wide-tolerance framework. Only trademarks could cause artificial differences in technology selection.

81. These factors indicate that large-units in the agro-industries' sector cannot bring any particular advantage to bear on this industry, particularly so in a developing country. Thus, it should be possible to bring about technology differentiation between large and small units by giving a preferential treatment to licensors (e.g. higher royalty rates) who would be licensing technology to small units.

THE ROLE OF THE 'LARGE-UNITS' PRIVATE SECTOR IN TECHNOLOGY POLICY

82. In contrast to the situation prevailing in most developing countries, there is presently a conspicious absence of large-sized private sector (industrial) units in Egypt. For historical reasons the role that they would have normally played has been assumed, with varying degrees of effectiveness, by the Public Sector. If Egypt is to attain its 8-fold growth in the next 20 years, together with reduced technological dependence on outside sources of technology, it appears inevitable that a large-units' private sector will have to be developed within Egypt.

83. For the reasons that follow, the most significant part that this sector can play in Egypt would be in the manufacture (and development) of industrial intermediates (e.g. industrial organic chemicals, major and minor ferro-alloys, alloy steel components, auto ancillaries, and the like). It is to be recognized that present tendency towards overdevelopment of the consumer goods industry, particularly durables, can create a demand for intermediates for which there is no efficient local manufacturing potential.

84. The manufacture of intermediates is highly dependent on the use of proprietory technology - that is, technology controlled by patents and trademarks, backed by a substantial amount of privately-developed, and confidentially-maintained, 'process know-how'. The ability to aquire such technology is dependent on the character and status of the recepient enterprise.

85. Foreign owners of viable technology would generally be unwilling to transfer such technology to public enterprises because of the difficulty of maintaining confidentiality of know-how. The transferor suspects that leakages would occur through personnel transfers, attrition, frequent reorganizations of enterprise structure, etc. Leakage implies that parts of the technology, or even its methodology, can be applied elsewhere without the ability of the transferor to gain commercially from such application. The Public Sector enterprise would generally be able to obtain only such technologies - and, in fact, be preferred recepients from the viewpoint of the licensor - where patents and trademarks are dominant rights of the licensor with 'know-how' playing an accessory or subordinate role (e.g. pharmaceutical formulations, branded soft drinks, etc.)

86. On the other hand, the joint-venture instrument, while very viable in most respects, is not an available instrument for the manufacture of intermediates in most situations. The overseas joint-venture partner, while he may have a wide technology portfolio (basic goods, intermediates and consumer products) generally prefers to invest only in consumer goods - it is particularly so with the trans-national corporation. The argument of the foreign enterprise is that developing country markets are too small for economics-of-scale in intermediates, thus unworthy of investment risk. However, where conditions are particularly attractive, the foreign firm may be willing to license technology, without concurrent investment, to a recepient who meets its tests for character and stature.

87. The large-units' Private Sector (or the 'organised Private Sector' to differentiate it from the 'dispersed sector') has traditionally been attractive to foreign licensors. First, because of its basic profit motive, and need for maintaining its competitive position in the market-place, the private sector unit takes great care to prevent leakages of technology. Second, it works to maximise production which favours licensor income. Third, it often adopts growth strategies to take advantage of the licensor's overall technology portfolio (introduce new products for which the licensor has good technology).

88. The feasibility of such association also favours national interests. The profit-motive makes the Private Sector unit an efficient utilizer of physical and financial resources. The ability of the local unit to survive without investment from the licensor (of technology) frees the enterprise from management controls which are characteristic of the joint-venture. The scope for the local unit to

geographically decentralise its production, once the basic technology contract period is over, can introduce distribution, and other, efficiencies. Further, Private Sector units in developing countries have demonstrated their capability to organize and support capital markets and thus obtain access to private risk financing. Again, they have shown the capacity to attract and service international loans on competitive terms. And lastly, they are capable of accepting those risks which a foreign investor would shy away from and which a Public Sector unit should not accept.

89. From the national viewpoint, the organized Private Sector can be a major instrument which the Government can creatively wield to achieve transfer of technological capability (see Paragraphs 33 - 35). By properly managing different incentives to technology aquirers and suppliers, the absorption, ownership and control of technology can be subordinated to national interest. For example, permissible high rates of royalty can be used (by the aquirers) to shorten the 'duration period' of agreements, thus giving them rights to expand or duplicate production facilities without obligation to, or restraint by, the licensor. */ A concurrent tax incentive to local producers can create the situation by which the aforesaid right will be exercised in reality.

90. It is obvious that the joint-venture will be less amenable to such incentives since new production facilities will require fresh investment by the overseas partner. Likewise, the Public Sector unit is not a suitable candidate since it responds weakly to tax (or other) incentives.

91. The highest relevances of the organized Private Sector is that it comprises of free-standing enterprises. Unlike the joint-venture sector, the enterprises are able to divest technology both from expatriate management; unlike the Public Sector, the enterprises have the confidence of private capital; and unlike the small industries sector, they are viable without subsidies.

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*/ See Guidelines (op. cit.)

THE ROLE OF THE PUBLIC SECTOR ENTERPRISE IN TECHNOLOGY POLICY

92. While recognizing the fact that in Egypt the Public Sector is a dominant manufacturer of basic, intermediate and consumer products, the general argument posits that since the Public Sector is usually an inefficient device as a producer of goods, its logical role should lie in engaging in those central and strategic products which either must not be delegated to other production sectors of the economy, or which will not, or cannot, be fulfilled by them.

93. In the present context of Egypt (that is, under its Open Door Policy, and the objective of planners that Egypt should have a multifaceted and diversified industrial structure), the continuing domination of the Public Sector, even in new product areas, is a clear indication that adequate and sufficient production instruments do not exist for distributing manufacturing responsibility. The inference follows that Public Sector manufacturing units should become the instruments for creating the desired diversified structure. In terms of technology policy, the requirement is that Government production centers should become focal points of technology diffusion.

94. That is, modern licensed technology which is being aquired by the Public Sector, either through the joint-venture mechanism, or through direct licensing, should be obtained under such arrangements and contractual conditions as will enable its lateral transfer to the Private Sector. Equally, contractual conditions must be present, and facilities of Public Sector enterprises so designed, that off-the-line and non-critical main-line requirements of the enterprise can be subcontracted or sublicensed, to Private Sector units. It should be recognized, in this connexion, that value-addition concepts should not be so pursued at the level of the main enterprise that it negates the consideration that a part of the value-addition could be made to occur at a point outside the enterprise at a lower cost, in real or socio-economic terms.

Contractual arrangements with licensors of technology can only ensure that the rights to lateral transfer, or rights to sublicense and subcontract components, prevail at the level of the technology-user (licensee); they cannot ensure, however, that such transfers will take place. For the latter to occur, economic mechanisms have to be devised; for example, to convert enterpreneur-traders to enterpreneur-manufacturers. Further, the Public Sector enterprise, which is using a particular

technology, will have to itself adapt or innovate upon it so that it becomes subcontractible or laterally diffusable. Still further, it has to develop the capacity to transfer technological capabilities to recepients of laterally-diffused technology.

INTERNAL TRANSFERS OF TECHNOLOGY

95. If it is the social policy of a country to create enterpreneurship, distribute economic opportunities, and avoid economic concentration of power, then a viable instrument would be the creation of multiple centers of production, that is, many units making the same product. While the spreading of capacity may vitiate economies of scale (see Paragraph 100) it is clearly a penalty paid for economic development.

96. Except perhaps in the case of Public Sector units, this multiplication could be encouraged in all the main production sectors: */ the joint-venture, the large-units' sector and the small (modern) industries sector. However, since the endowments of the sectors differ, certain sectors would be better qualified and more appropriate for particular industries.

97. Technological strategies should promote this process of multiplication. It must be recognized that once a technology has evolved, it is infinitely replicable. Replication, however, does not take place in practice because the new body of knowledge is artificially protected by patents or secrecy. Such technology is, therefore, transmissible only through licensing - or, in some cases - only through the joint-venture. From these points, however, it cannot again diffuse into the economy because of the legal constraints that can be placed on the recepient of technology. Thus, in the short-run, multiplication can only be promoted through a pluralit of licensing agreements (usually different licensors). Th ough expensive in terms of technology cost, these enterprises essentially become nucleating centres for the eventual propagation of the technology.

98. For the needs of the long-term, transfer of technology (TOT) policies should be directed at promoting well-compensated short-duration agreements, particularly where secrecy alone in the protective cover for technology. Where provisions in

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*/ Multiplication, of course, is widespread in rural and village industries.

contracts, further, provide the basis for transfers of technological capabilities (Paragraphs 33 - 35), a sound foundation is laid for lateral, or internal, transfers of technology. Either the enterprise itself can replicate the 'technology' at another geographic point (new personnel now obtain access to technological capabilities) or it may retransfer ('sublicence') it to another party. Technological strategies, as tax incentives for such transfers of technology, can further promote this form of diffision.

99. Where such diffusion is promoted through the use of domestic engineering (consultancy) services, use of local manufacturers of equipment and components, and such, technology capability, in effect, moves into the external economy of the sector - to 'consortiums' of firms. From such sources still further multiplication can take place. In effect, through these diffusions, 'technology' transforms itself into professional capabilities.

100. Economies-of-scale arguments are often overstressed to imply that modern technology cannot be fragmented. It is true in many cases that technology, as presently developed, cannot be capacity-partitioned. However, for the market-needs of the developing country, viable modern technology is available in many areas for low levels of production. In India, for instance, there are scores of 'mini-oxygen' (60 cu. mtrs/hr. capacity), 'mini-steel' (5 tonnes per days electric arc furnaces), 'mini-detergent' (dry-blending) and 'mini-paint' plants, and tens of 'mini-drycell' (60 million cells per year), 'mini-paper' (7 tons per day or less) and 'mini-tyre' (bicycle and scooter) plants. Many of these either use (current) foreign licensed technology or have been set up by foreign technical assistance in the last 5-7 years. These units, being geographically dispersed, have advantages in distribution costs (and some tax advantages) which enables them to co-exist with large plants. (Some of thse 'mini-plants' have evolved through lateral transfers of technology).

101. The term 'replication' used above essentially means that the technological route for the production of a product remains unchanged from plant to plant; further, replication involves transfers of technology through contractual mechanisms. (That is, they are 'contracted forms of technology transfer').

102. An equally important mechanism is immitative developments of technology through means of improvisation. Observed success in an enterprise is imitated through a different technological route. This is particularly relevant in the small-units' industry. Technology transfer, in these cases, takes the non-contracted form.

103. In many instances, the replication or imitation of technology cannot take place without transfers of methodology from research laboratories to industry. Raw materials may need modification or processes would have to be altered to suit raw materials. These linkages must, of course, be concepted in technology strategies.

Laboratory-Industry Transfers

104. Unless technology policy is established on a restrictive bias by limiting access to foreign technology when local sources exist, */ it is extremely difficult to develop mechanisms to protect and promote laboratory-developed technology, unless of course, it is demonstrably superior in commercial terms or is patent-protected.

105. Reform of the patent-system (as accomplished in Mexico and India) can facilitate internal transfers of technology but this mechanism, again, is defensive in strategy. And it would conflict with objectives in Law 43.

106. Nonetheless, there are some useful mechanisms which can increase and improve the laboratory-institution/industry interface. One of these is to require public engineering (and like) institutions, where the linkage is appropriate, to act as 'prime contractors' to foreign-assisted projects, to whom the projects' other consultants (foreign or domestic) would be subcontractors. As projects are established and succeed, the domestic institution achieves the necessary commercial image to become a focal point for subsequent projects. (A good example is PEMEX in Mexico for the petrochemical industry, but less so is Engineers India Ltd., in India, which has responsibility over entire ranges of industry).

107. The other mechanism is through TOT Policy. Where local capabilities exist, foreign technology can be made more expensive to its recipient (by imposing certain obligations on him as export, value-addition, etc.) or technology 'cheapened' to its supplier (through lower royalty rates, shorter 'duration times', 'buy-backs', etc.) so that such transfers of technology are inhibited without being excluded.

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*/ In India, for example, a strong local-industry/national-laboratory 'lobby' has emerged to obtain the 'restrictive bias' in Government approvals of technology.

DRAFT INTERIM PROPOSAL FOR TRANSFER OF TECHNOLOGY POLICY (EGYPT)

Preface

The term 'general principles' used in this policy draft indicates that it has its origin in Technology Policy. The term 'specific principles' are those that the Technology Transfer Centre would develop to administer the policy set out for it. They are usually legal-administrative in character. Neither the general nor the specific principles should be considered, at this time, complete statements.

Numbers shown to parentheses at the end of the paragraphs refer to considerations in 'Technology Policy' and refer to its structure of paragrpahs. That is, the rationale for the Transfer of Technology Policy (TOT Policy) is presented in the discussions of Technology Policy.

Policy

(i) This Policy, termed the Transfer of Technology Policy, will be used in the Egyptian Governmental system as an instrument in the process of approving technology agreements involving the import of foreign technology into Egypt: the term 'technology' will have a broad implication including special market rights and privileges but shall only relate to the use of technology in the industrial production system.

(ii) Consistent with existing systems and forms of Governmental Administration, decision authority on transfers of technology, including approvals of transfer-of-technology agreements, will remain decentralised and associated with project approval bodies.

(iii) In order to obtain a consistent and systematic appraisal of the objectives, terms and conditions in technology transfer, to bring about clarity, stability and uniformity regarding inflow of technology, to strengthen national and entrepreneurial bargaining power, a specialised agency, the Transfer of Technology Centre (TTC) shall be established within the Governmental system. This Centre, besides related roles (covered separately)*, shall have the obligatory function of rendering advisory and consultancy services to decision-making bodies.

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* Section IV.

(iv) TTC shall have the right and responsibility to appraise all agreements relating to the transfer of imported technology into Egypt, except contracts bearing on:

a) military projects
b) projects in Free Zones, and
c) large projects associated with multilateral agreements or projects in industrial infrastructure.

In recognition that the transfer of technology agreement, and the purposes of a project, are parts of a whole, both directed to national objectives, the following general and specific principles shall be applied by all concerned to the total process of technology acceptance.

General Principles

A. Consistent with the 'Open Door Policy', and Law 43 of 1974, the general policy towards the transfer of foreign technology to Egypt shall be promotional in character and not defensive in strategy.

B. In principle and objective, transfers of technology will be managed to create a competitive market environment in the country, avoiding to the extent possible, those contractual or other arrangements which will give any firm in Egypt, in any industry sector, an excessively dominant or privileged share or position in the market place, domestic or export.(3,10,26,36,39,40,48,74,93)

C. Transfer of technology will be managed to see that it will not have an unanticipated adverse impact on indigeneous efforts to develop technology, on existing technology, or on policy-supported sectors of the industrial structure as the small-scale and low-investment industries. (10, 76-77, 104-106)

D. Transfers of technology should relate to genuine technologies of industrial utility and clearly demonstrate their technological content and objective. The transferor of technology should assert, through contractual acceptance, the modernity of his technology, or its appropriateness, or the competitive character of the products and processes developed, or the superiority thereof: further, the technology that its transferor proposes to transfer should be supervised to see that it is, indeed, transferred and not transferred in diluted form. (2, 35, 37, 57, G *).

G * Guidelines for Evaluation of Transfer of Technology Agreements, United Nations, New York (1979).

E. The transfer of technology should ensure the simultaneous transfer of capability: that is, the transfer process should be so influenced so as to achieve the conditions that; (a) the technical skills to manage manufacturing sequences and maintain production, the knowledge skills to change expand or diversify production, and the organizational skills to manage the enterprise profitably are transmitted to its national managers in proportion to their receptive capacity and (b) the techniques of the production system percolate to the engineers, technicians and operators through purposeful creation of absorptive power within the enterprise. (33-35, G)

F. The total process in the transfer of technology should be so managed that the decision-making powers and rights of the enterprise to expand, change, or diversify its production or capacity, are not curtailed, and in fact and purpose will be explicit rights of the enterprise in a discernable time-frame. (33-35, G)

G. Contractual agreements between enterprises shall be guided by the principle of full reciprocity and equitable relationships. Compensation for technology will be related to the industrial advantage gained by the recepient enterprises, to guarantees provided, to the rights and capabilities the transferor grants for the employment of acquired technology, and to the access the transferor provides to the recepient in terms of new and protected markets. Limitations on the enterprise in the use of technology or the distribution of its products will be reciprocally related to the general and special privileges granted to the transferor. (8, 38, 66, 67, G)

H. Transfers of technology must be protected, where necessary, by grants of 'market rights' covering not only nationally-registered patents and trademarks, but also by providing access to organized overseas markets of the licensor; however, for the sole Egyptian market, it must be ensured that market rights are not being transferred in the guise of 'technology' (that is, licensing should genuinely transfer industrial technology). (35, 37, G)

I. Over the long time period, the process of technology transfer must be managed to reduce technological dependence of Egypt rather than increase it: appropriate forms of it, as the joint-venture, should be seized as major instruments for creating R & D facilities in the enterprises receiving technology. (57-58, 66-67, 98)

J. Those forms of technology transfer which would be viable in small units should be encouraged through 'collective purchasing', or through incentives as royalty, and small units so formed, then consciously used as nucleii for horizontal transfers of technology - that is, the multiplication and geographic spread of replicative or immitative units with different ownerships. Equally those forms of technology transfer should be discouraged, or made more expensive, which would in large units either cause the disinvestment of existing, but otherwise viable units, or cause these to be acquired by the large units with special consequences. (40, 81, 97, 101-102).

K. Those forms of technology transfer should be favoured in an enterprise which could cause substantial value-addition; however, value-addition at the level of an enterprise should not be so pursued or rewarded that it negates the consideration that a part of the value-addition could be made to occur at a point outside the enterprise, at a lower cost, in real or socio-economic terms. (36-40).

L. Consistent with other considerations in value-addition, the process of technology transfer should be so managed, particularly in operations as the joint-venture, that value-addition, at the level of the enterprise, is maximised through competitive purchases of major inputs and competitive pricing of output; those situations should be avoided wherein value-added is lost or leaked through unsupportable arrangements for the sole purchasing and/or the sole selling of goods by major partners in the enterprise. (37)

M. Apart from projects in priority industries specified in Law 43, transfers of technology accompanied by investment will not obtain a preferential treatment over direct transfers of technology in relation to the acceptance of terms of technology transfer. (53-66)

N. This Policy views the joint-venture at a major vehicle for the transfer of management methodology and techniques to Egyptian enterprises. The process of joint-venture formation will be manoeuvered, to the extent possible, by requiring the overseas partner to agree to Management Services Contracts of a fixed time frame; in Joint-Ventures where technology is likely to be trivial or secondary to trademarks, market-rights and the equivalent, or where there is capitalisation of intangible proprietory rights, or where the overseas

partners equity position is nominal, or where payments are to be made for overseas "head office expenses", the Management Services Contract will be essential requirement provided the enterprise employs substantial personnel. (57-64)

Specific Principles

A. To clearly establish the accountabilities of the firm which is supplying both technology and machinery, to obtain desired focus on technology, and to establish different responsibilities on the departments reviewing machinery and technology, on the one hand, and technology agreements on the other, every effort should be made to separate machinery contracts from technology transfer contracts at the pre-project acceptance stage. (G)

B. As above, and for same purposes, every endeavour should be made to separate, in the case of joint-ventures, prometers'and founders' agreements from transfer-of-technology agreements; and where applicable, management service contracts from machinery contracts. (53-56, G)

C. In order to bring about desired association of investment and technology, and more particularly, between levels of investment and technology quality, project approvals should be made subject to the approval of asscciated technology agreements in cases where they would follow project approvals. (53-56)

D. In joint-venture projects, the capitalisation of patents and trademarks, permitted under Law 43, should relate to patents and trademarks which shall be used in Egypt. Contracts should show licensor's obligation to employ patent knowledge, and the rights of the patents transferred, and of the rights of the enterprise to use licensor's trademarks when the quality of the products meets licensor's standards; further, the licence agreement must demonstrate that the technology transferred is such as to warrant the application of trademarks to the products of the joint-venture. (G)

E. Public Sector projects receiving technology from abroad, or through the joint-venture mechanism, should not be constrained in contractual arrangements from entering into collaboration agreements with others than the first licensor in relation to non-competing products or processes, independent of

the consideration as to whether the new product (or process) will be manufactured, or utilised, at the site of the first venture or not. (67, G)

F. All project approving authorities shall use utmost discretion in renewals of agreements; renewals of agreements should be conditional to new technology, or a major process modification or a new product, being introduced or access given to a new market; all occuring to the enlarged benefit of the enterprise. (G)

G. All contracts shall identify the form in which the technology will be transferred, either as know-how or technical assistance or patent or the like or combinations thereof; to the extent possible the value of each of the contractual elements should be separately indicated and the licensor's accountability for performance of each of the elements specified. (G)

H. To the extent feasible, technology should be 'unpackaged'. These transfers of technology should be promoted or given priority which will use local services for detailed engineering and construction; to promote such, the Government will give facilities to and compensate overseas engineering firms who will establish local offices, even on a short-term basis, to carry out their engineering function. Equally, joint-ventures for consultancy engineering services should be able to obtain priority status under Law 43. (G)

I. In order to achieve capabilities in Egypt for the long-term maintenance or operations of production plants, the Government shall have the right to fix the minimum period for the stay of licensor's technical personnel.

J. Technology proposals shall be appraised for the technical needs of an optimum product distribution system and such technical support should be within the role of the supplier of technology. Situations will be avoided where this role of the technology supplier cannot be fulfilled.

K. An enterprise's dependence on components from the supplier of technology should be examined to see if such components are within the control of the supplier; where this is not so, the enterprise should have independent rights to purchase them from other sources, competitive or not. Agreements must make this right explicit.

L. The right of a firm to expand its capacity should not be curtailed by the licensor so long as the enterprise, within the duration period of the agreement, can compensate the licensor on the same basis as upon which the enterprise was first founded. (G)

M. The right of an enterprise to subcontract to a local or a foreign firm a part of its needs, other than product, should not be curtailed by the terms of agreement under its secrecy provisions; in fact, it must be an express right of the license so long as he undertakes the obligation to supervise the subcontracts to maintain confidentiality.

N. Over the duration period of an agreement, personnel of the enterprise should have the express right to visit licensor's plants to learn of process and product improvements and to receive licensor's assistance thereto. (G)

SECTION VI: IMPLICATIONS TO THE LONG-TERM UNIDO PROGRAMME FOR EGYPT

As this Mission concludes, no clear consensus has emerged either on how the TTC should be placed in the Governmental System (a'national Centre' or a Centre in GOFI), or what would be its basic form - the evaluation of technology agreements or the selection and appraisal of technology. The basic reason for this uncertainity is that the Working Papers prepared by this Mission (essentially, a synopsis of this Report) have received a very limited circulation. Outside of GOFI, no other Ministry or organisation involved in matters of technology transfer have examined the alternatives and suggestions of the Mission.

At the same time, no statistics are available on the total number of technology agreements executed by Egypt; thus, it is not feasible to evaluate how large a group the TTC should be or how it can be organised and trained. Further, there is a paucity of agreements which can serve as investigatory material on how technology transfer is taking place in Egypt.

UNIDO's new inputs must be organised on the response of the Egyptian Government to the following questions (covered in this Report, in the Working Papers or in other discussion papers):

1. Does Egypt want a national centre? Is it feasible in the near term? what will be its authority structure?
2. What should be the focus of the work of this Centre: appraisal of technology agreements or the evaluation/ selection of technology? If latter, what would be the range of technologies (i.e. the concern of which Ministries?) and how will the TTC interact with the Ministries?

3. If the Centre is to be a national Centre, which form of organisation does it prefer? (Options presented in this Report, or other?)

4. If UNIDO is requested to train members of the TTC, how many members will there be? What will be their backgrounds? How will TTC be organised, taking into consideration the options of this Report? Will the members of the TTC be drawn only from GOFI or from GAFI and the Ministries?

5. If training (by UNIDO) is to be 'by doing', is there sufficient case-history material?

6. When should the TTC become operational?

Annex

INDUSTRY PLANNING AND REGULATION IN INDIA

Industrial and economic planning is centralised in India and is the responsibility of the Planning Commission, whose chairman has tradionally been the Prime Minister. India plans for a " Socialistic Pattern of Society".

Based on economic objectives (pre-capita income targets, industrial growth rates, saving/income ratio, nutrition standards, etc), the Planning Commission develops a long-term 15 Year perspective plan and a short-term Five-Year Plan (not a 'rolling plan'), which become effective on adoption by the Parliament. The industry-component of the Plan has both macro and micro components (the latter in only nationally-significant products). All such information, and the Five-Year Plan itself, are available as public documents. The Plans are first published as draft documents for public discussion.

Planned industrial objectives are sought to be achieved both through the public and private sectors. The role of these two sectors is defined in the Industrial Development (and Regulation) Act, 1951.

Under this Act : (1) certain industries/services are either wholly reserved for the Public Sector -atomic energy, firearms, aircraft, petroleum, etc) or will progressively come into the

Public Sector (steel, coal, electric power, aluminium, etc)* (2) certain industries, which are enlisted, while not wholly reserved for the Public Sector, will have public sector units operative in it, in free competition with the private sector and (3) unless required in the context of public interest, all remaining industries will be predominantly in the private sector. (Joint-Sector units in which the provincial governments collaborate with the general public, or with private sector partners, are treated as units in the Private Sector).

Under the "balanced development" mandate of the 1951 Act, the Government has in the last 10 years, progressively reserved certain products (about 850 products) exclusively for the Small Scale Sector (fixed investment in machinery below £ 70,000 = Rupees One Million).

There are two other 'sectors', one traditional and the other of very recent origin. The first of these is the handloom and cottage industries (handicrafts) sector which is oriented to village development; the industries being those that do not use electric power. The newer group is a variation of the small-scale sector, called the 'tiny sector' (fixed investment below £ 7000 = Rs 100,000). Both differ from the small-scale sector only in terms of the regulatory agency concerned and

* This second provision was necessary as previous to 1951, certain of the products/services were (& still are) in the private sector. Except for expansion of existing plants, all new plants in these product areas are initiated and owned by the Public Sector.

concessions granted.

Under the regulatory mandate of the Industrial Development Act, all industrial units, whether in the public or private sectors, are required to obtain an industrial license if :

(a) the intended product is listed as requiring a license

or (b) if fixed investment exceeds £ 700,000 (= Rs 10 Million).

This license is issued by the Ministry of Industry * in consultation with the 'Sponsoring Ministry' (say, Ministry of agriculture for a project involving pasticides) and 'Economic Ministries' (Ministries of Finance, Planning, Commerce, Law, etc).

An entrepreneur, for example, if he can demonstrate his capability to implement the project, will be given an industrial license for any licensable product (products eligible for industrial license) so long as it is not reserved for the Public Sector. The license is cancelled if the intended project is not implemented (started) within a period of 2 years from date of license.

If the product is reserved for the small-scale sector 'approval' is given by Directorates of Small-Scale industry which have been established in the capitals of the various Provinces (States). Approval is through registration. If the product is, however, reserved for the 'tiny sector', approval (registration) is given by District Industrial Centres.

* This "channelling" is facilitated because of " product " emphasis in distinguishing between industries & sectors. A Tourism Center, or a Hotel, for example, does not require a industrial license.

Registration merely provides certain advantages as tax benefits, credit facilities, etc. Registration, however, is not compulsory if Government or State facilities, as 'industrial estates' are not involved.

If, on the other hand, the applicant is a firm, and not an entrepreneur, whose existing industrial investment exceeds Rs 70,000, it will not be permitted to enter into product areas reserved for the 'small-scale' and 'tiny' sectors.

FOREIGN TECHNOLOGY AND FOREIGN INVESTMENT

A local firm, in any sector whatsoever, must obtain an Industrial License (or Central Government Approval) if the proposed project involves the use of contracted foreign technology(even if payment is not to be made) or if foreign investment is involved.

The Government periodically revises and publishes three product lists which indicate the liklihood of the Government approving foreign technology/investment (for their manufacture):

1) a list of products for whose production the Government will not ordinarily approve either foreign investment participation or foreign technology.
2) A list of products in which foreign investment (and technology) is invited or considered desirable, and

3) A list of products for which foreign technology will be permitted but not foreign investment.

In addition to industrial regulation, there is the Foreign Exchange Regulation Act, (FERA) 1973 which concerns transactions in foreign exchange* and foreign investment. It is administered by the Reserve Bank of India in consultation with Government.

Under (FERA) bye-laws, all new companies unless 100 % export-oriented, inFTZ, or in strategically crucial areas must have a foreign capital content below 40 %. All existing companies must have at least 26% of Indian capital. Ordinarily, unless a project is basically export-oriented and/or utilises "high-technology",** foreign investment in existing firms must be reduced to below 40% by 1981. However, a temporary 'resting phase' of 51% is permissable under special conditions. Trade in imported products or of manufactured local products of third-parties, consultancy, or aquisition of firms etc are not open to firms in which foreign investment exceeds 40%.

No centrally-administered public sector project has foreign investment. Foreign investment below 40% (generally 26%) occurs in some joint-sector projects.

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* Flows of foreign funds into and out of the country have to approved by the Reserve Bank of India. There is stringent control.

** determined by consulting the National Committee for Science & Technology.

In India there is very little foreign investment in the 'small-scale' and 'tiny' sectors. Foreign technology also plays a limited role.

For appreciations of the above regulations, it may be noted that in India :

1) there are more than eight million 'cottage' and handloom units in great geographic spread.

2) there are about 300 Public Sector (industrial) companies, none of which is a joint-venture, or has participation from the general public.

3) including the above Public Companies, there are about 55000 companies in India (private limited companies, joint-venture companies, subsidiaries of foreign firms, joint-stock companies and joint-sector companies) which are registered under the tightly enforced Indian Companies Act, 1956.

4) there are about 4500 'Public Limited' Companies (defined as having over 50 share-holders, publicly tradeable shares), the balance being largely private-limited companies. (Some of whom have employment exceeding 1000).

5) there are about 1500 Companies in India with foreign investment (both in public limited and private limited companies). Of these, less than 70 have (today) 100 % foreign ownership (largely drug companies). 80 % of the

remaining companies have foreign investment below 40 %. Very few companies, with foreign investment, have less than 26 % foreign ownership.

6) While growing in number, there are fewer than 20 companies in the joint-sector with foreign investment; there are about 300 - 400 "two body" joint-venture companies (à la Egypt pattern).

7) There are about 400 companies in India which are now, or earlier were, "controlled" subsidaries of foreign firms, principa y multinationals.

8) India has screened and registered upward of 6000 technology agreements; of which about 4500 are currently operative. Presently, approvals of new/renewed agreements amount to about 300 annually.

9) 75 % of total industrial employment is with cottage, handloom, 'tiny' and 'small-scale' industries. The latter four sectors produce 50 % of all goods in terms of value.