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TRANSFER OF TECHNOLOGY:
NEEDS AND EXPECTATIONS OF DEVELOPING COUNTRIES

by:

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Role of Technology Transfer
in the Development Process

Technology transfer as defined by an international organization means "the importation of certain technological factors from developed countries to developing countries enabling the latter to set up and operate new production facilities and to expand the existing ones." In a broader context, technology transfer may also be defined as the importation and adaptation of exogenous technologies to be used in industrial production and extension of these technologies to the future development of indigenous technology.

Along with the recognition of the critical role of technology in development was the international realization of technology transfer as a major determinant for the industrialization and economic development of the countries which are still in the process of development. At the moment there exists an enormous disparity in the level of technology

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among countries. Since it is well accepted that developing countries are seldom able to afford the cost of basic technology research and development, transfer of technology has been identified as the solution to the problems associated with this disparity. The transfer of technology from the advanced countries to the less developed countries becomes a critical step towards elevating the productivity in developing countries and towards reducing the income gap between the two. Increased earnings in the latter would be extremely difficult to achieve without providing them technological inputs for production, mainly from advanced technologies. Technological inputs thus sets the pace and pattern of development by determining the efficiency at which a country's natural factor endowments are integrated in creating economically increased values. It is the nature of available technology for instance, which determines the factor of production to be maximized and the degree to which such factors of production can be productive.

Major Issues on the Transfer of Technology

The past two decades witnessed a growing international awareness and concern over the problems faced by technology recipients, particularly those in developing countries.

It has been correctly pointed out that there are always two sides to a technology transaction: the supplier and recipient of technology. This means that at any one time, any country can both be a supplier and recipient of technology. This also means that technology recipients either they be in developing or developed countries encounter the same obstacles in technology transfer. However, a significant distinction stems from the fact that while technology recipients in developed countries can effectively eliminate such obstacles by the strength of their technological and economic capabilities; the weak bargaining positions of technology recipients in developing countries exposes them and make them vulnerable to the quasi-monopolistic power and practices of technology suppliers, particularly the Transnational Corporations of developed countries.

The principal concerns of technology recipients in developing countries stem from the restrictive and abusive practices of technology suppliers which in the end proves detrimental to the development of their national scientific and technological capabilities and perpetuate their technological dependence on technology suppliers. They also cover concerns over inadequate development of technologies

which are suited to the specific economic, social and ecological conditions of technology recipients in the developing countries.

The abusive practices of technology suppliers include, among others (1) cartel-like arrangements among technology suppliers which artificially reduce the alternative sources of technology available to technology recipients, (2) restrictions in the field of use of technology which bar the recipient from extending his production to other goods which might be of greater use for local needs or might have a greater chance of being exported, (3) volume restrictions which among others, prevent the recipient from producing enough to be able to export, (4) tied purchases, (5) excessively long duration of contracts which may mean that the technology may become outdated, or become inadequate for the new needs of the recipients (6) restrictions on exports, (7) excessive cost and pricing of technology transferred.

Cartel-like arrangements among technology suppliers could take the form of : import cartels; rebate and other price-fixing arrangements; national export cartels:

¹ Trade and Development Board, UNCTAD, Preparation of a Draft Outline of an International Code of Conduct on Transfer of Technology, TD/B/C.6/AC.1/2/Supp. 1 ; p. 25

international cartels allocating markets or controlling exports or imports; private and semi-official agreements on certain standards; specialization cartels; exchange of technical information, including cross-licensing and patent pooling; rationalization cartels; and marketing arrangements. Like any other arrangement which artificially limits competition through an orchestrated intervention in the market, cartel-like activities harm the consumers, in this case, the technology recipients. The technology buyer's range of choices becomes limited which may give him no alternative but to settle for the available technology even if such does not completely satisfy his requirements and forces him to submit to the conditions imposed by the technology supplier, including exorbitant prices for the technology.

Restrictions on the field of use and volume restrictions have the effect of preventing the technology recipient from maximizing the use of the technology acquired. Such conditions imposed by the supplier at times, may also serve the purpose of market allocation and market control - the former, by leaving other types of products to the supplier or other recipient; the latter, by enabling both the supplier and the recipient to maintain a certain price level to the disadvantage of the consumer.

The technology recipients' objection to tied purchases on the other hand result from the marked use of such clauses in technology contracts by technology suppliers as a source of additional income and as a means of overpricing inputs. Tied purchases, in certain cases, could even be requested by the recipient for technical grounds, such as when the material input is made only by the technology supplier or in order to guarantee the quality of the product for export. With the exception of these cases however, technology recipients bewail the often unjustified demand for tied purchases by technology suppliers, especially in cases where it is clear that the required raw materials and/or capital inputs can easily be sourced from the recipient's country, or at a cheaper price from suppliers elsewhere. Under these circumstances, tied purchases inhibit the use of indigenous raw materials and the development of domestic intermediate capital industries.

Export restrictions, from the point of view of technology recipients in developing countries is one of the highly undesirable practices of technology suppliers. Restrictions could take several forms among which are global bans on export; restrictions on products and/or markets; and requirement for prior approval to export from technology suppliers.

The developing countries' objection to export restrictions is not only because it is another demonstration of the technology supplier's abuse of the right over the technology. A more compelling reason is that such export restrictions directly limits the developing countries' ability to generate foreign exchange resources which are critically needed to finance long-term national economic programs and to service their international financial obligations. Furthermore, export restrictions hampers the acquisition of marketing skills and leads to continued dependence on foreign distribution channels. In the case of product restrictions which more frequently applies to industrial products, such restrictions retard the development of more dynamic export-based industrialization and prolongs the developing countries' dependence on exports of primary commodities whose prices are vulnerable to international supply fluctuations.

Prices of technology is frequently a source of disagreement between the supplier and the recipient of technology. Under an imperfect market condition for technology where the supplier exercises substantial control over the technology and the related technological information, the recipient more often than not ends up paying exorbitant prices for the technology imported.

Technology payments often takes the combination of : royalties for the use of industrial property rights; payments of service fees to specialized personnel; commissions for corresponding purchases or sales for the licensee; payments arising from the purchase of machinery or other goods by the recipient.

Exorbitant charges arise from among others: charging of royalty rates which are far higher than the value-added contributed by the technology; packaged transfers through which the supplier is able to attribute different charges to various items and to interchange and spread such charges through accounting manipulation; transfer pricing; conversion of intangible assets to equity holdings in the recipient company which results in much higher payment for the technology in the form of returns to capital investment; and payments for unwanted goods and services in the case of tied purchases.

Needs of Developing Countries
in Technology Transfer

The economic and social enhancement of developing countries depend to a large extent on their (1, technological transformation, and (2) technological self-reliance.

Technological transformation as defined by UNCTAD consists of much more than mere imports of external technology or, for that matter, the domestic absorption of such technology. It embodies the maturing of the social technology -- the mastering of the skills to produce these very instruments and processes, to organize, administer, manage and plan their future development, to distribute their fruits equitably and to ensure a cohesive and harmonious advance of the whole society.² Technological self-reliance, on the other hand, includes the ability to choose, implement, manage, operate, innovate, and if necessary, invest in technology.³ Taken together, the development of these two characteristics equals to the building-up of national technological capacity.

Efforts at technological transformation in developing countries are critical components of broader economic/social policies which are commonly directed towards the following goals:

- (a) alleviation of poverty
- (b) generation of more productive employment

² UNCTAD, A Strategy for the Technological Transformation of Developing Countries, p. 1.

³ Ramesh, Jairam and Weiss Charles (eds). Mobilizing Technology for World Development, p. 11.

- (c) promotion of equity and social justice
- (d) the attainment of self-reliant and sustainable economic growth

In respect of these goals, the corresponding technological requirements are as follows:

- (1) Technologies which cater to the needs of farms, small-scale rural industries, the informal urban sector. For instance, research on technology could focus on the natural methods for fixing the nitrogen content of soils in lieu of costly chemical fertilizers which drain the small farmers' income. Likewise, health research could be redirected towards the discovery of inexpensive cures for the most prevalent diseases among the poor such as river blindness, schistosomiasis, diarrhea, etc. As it is, over one hundred times more in research funds is devoted to diseases most prevalent in developed nations such as cancer and heart ailments.

- (2) Capital-saving technologies which would capitalize on the labor resources of developing countries and at the same time promote

efficiencies. While it is acknowledged that appropriate technology can embrace all types and all levels of technology, it must also be recognized that productive endeavors in developing countries -- from farms to industries -- are characteristically small and labor intensive. In this regard, large-scale production processes formulated in developed countries should be scaled down to suit the needs of developing countries.

- (3) Indigenous technologies principally those utilizing indigenous raw materials and adapted to indigenous skills. This requires technological adaptation and innovation which in turn calls for the gradual building of scientific and technological R & D institutions, dissemination of technological information, and training programs at all levels designed to develop the country's technological capacity.

- (4) Technologies which harness the international comparative advantage of products produced for export. Developing countries are to a great extent, dependent on export earnings to finance the importation of the capital

resources necessary for industrial development as well as to service international financial obligations.

Initiatives of Developing Countries
On Technology Transfer

In order that technology transfer may serve as a catalyst for development, the technology transferred must (1) be judiciously selected in relation to the strategic priorities of the recipient, (2) not impose undue burden on the financial resources of the recipient country in terms of unreasonable payment for the technology acquired, (3) contribute to the development of the recipient country's technological capability and technological self-reliance. Otherwise, technology transfer could prove detrimental to development as has been the unfortunate experience of several developing countries during the early stages of technology transfer.

In recognition of the delicate relationship between technology transfer and development as well as of the weak bargaining positions of technology recipients in their countries, the governments of developing countries had, over the past years taken conscious effort to review and evaluate technology transactions. Such evaluations are aimed at ensuring that the developmental requirements of the recipient

country are properly addressed and at minimising the onerous burdens of the transactions on the technology importer which stem from the weak bargaining position of the latter vis-a-vis the technology supplier. In essence, the review and evaluation of the proposed technology transactions are addressed at the following concerns:

- (1) The use of the technology/industrial property right(s) will lead to substantial contribution to the national development objectives and goals such as employment generation and export promotion, use of indigenous raw materials, conservation of energy, etc.
- (2) The use of technology/industrial property right(s) answers an immediate need taking into account the gap between the requirement of the industry and the national technological capability.
- (3) The use of technology/industrial property right(s) does not result in environmental pollution, and/or health hazard to employees of the technology recipient and to the community at large.

- (4) The payment for the technology is reasonable in relation to the value of the technology to the technology recipient and the national economy. In this regard, the reasonableness of the payment is measured in terms of : the scope, complexity and pioneering nature of the technology; importance of the technology in relation to the technology recipient's overall activity; degree of mastery of the technology by the technology supplier; stage of the product in the product life cycle; use of indigenous raw materials and services, energy savings, level of priority of the licensed activity; employment generation; export earnings and its effect on the balance of payments; spill-over of technology to local industry; technology supplier's share in the technology recipient's profit; royalty approved for the industry under which the licensed product is classified.
- (5) The technology contract does not contain unreasonable and unjustified restrictive clauses, of the type mentioned earlier in the paper.

Expectations of Developing Countries
on Technology Transfer

While the developing countries assume primary responsibility for their own development, it must be recognized that they face serious limitations and constraints in this direction. This is particularly true with respect to technological development, for which enormous resources not available to developing countries, necessarily have to be expended. Thus, technology transfer, usually from developed countries assumes a critical role in the developing countries' technological development.

In view thereof, developing countries expect the cooperation of technology suppliers from developed countries in the transfer of technology which are supportive of their development objectives. This involves, among others, (1) the transfer of technology which are responsive to their economic, social and ecological requirements, (2) payment for the use of technology which are commensurate with their economic and social value and to their degree of importance to the developing countries' economic priorities, and (3) elimination of restrictive clauses which not only adversely impact on their economic resources but more importantly, on the future development of their own technological capability.

Additionally, from the governments and institutions of the developed countries, which are usually the home governments of technology suppliers developing countries expect a recognition of the special circumstances of developing countries which serve to hinder technological development. In relation to this, developing countries seek the developed countries' assistance by way of (a) encouraging private enterprises and institutions of their countries to adapt their technology and assist in building the necessary infrastructure in developing countries; (b) taking steps in both the bilateral and multi-lateral fora to strengthen the scientific and technological capabilities of developing countries; (c) taking into account the requests of developing countries for strengthening their infrastructure for receiving and adapting technologies in the development assistance and financing programmes of developed countries. Over and above these, developing countries expect the governments of developed countries to respect their sovereign rights to draw up national legislations which are directed towards the rational transfer of technology to their countries while at the same time preserving the legitimate interests of technology suppliers.

The Existing Situation in International
Technology Transfer

Deliberations in various international fora participated by both developed and developing countries have agreed on the

need for concerted international and national efforts for technological development, particularly in developing countries. Such agreement had also emphasized the significant contribution/expectations from developed countries in this process.

The reality, however, is far from encouraging. For instead of taking a step forward in the achievement of these agreed goals, some developed countries are seen to be moving backward from this direction. These developed countries are increasingly taking moves which not only makes it extremely difficult for developing countries to use the former's technologies, but more particularly, compromises the future economic development of developing countries. In this regard, we cannot help but assume that this is upon the instigation of technology suppliers.

The most lamentable development is the widespread move by the governments of the developed countries themselves to wield their vast economic powers in behalf of the private technology suppliers in their respective countries. The developed countries are not only departing from their commitments in international fora to help create conditions conducive to the international transfer of technology, but more importantly, they are drawing up national legislations and implementing nationwide sanctions on those countries

which they perceive to be inadequately providing protection for intellectual property. Such moves by the developed countries cannot but polarize anew the relations between developed and developing countries inasmuch as the former are now again perceived by the latter to be unfairly exploiting their vast economic powers to discipline "erring" weaker countries. Such moves could likewise irreparably set-back and harm the economic development of the developing countries since penalties and sanctions are not confined to the individual parties of the transactions but are imposed on a national scale. More often than not, such sanctions and retaliatory actions are directed towards where it hurt the most: on critical exports of the concerned developing country to the market of the developed country.

In terms of magnitude and impact, those current practices of developed countries which can inflict the most damage are as follows:

- (1) Unilateral adaption of restrictive national legislations on the use of intellectual properties which serve the narrow commercial interests of private business. Other than their disregard of the internationally agreed objectives on technology transfer, these

legislations are more lamentable in their application of highly subjective criteria and the imposition of severe penalties such as withdrawal of market access for the products of the "erring" recipient country.

(3) Unwarranted application of government pressure and of the economic power of the developed countries to interfere and revise the national legislation on technology transfer and related intellectual property laws of developing countries which would favor the narrow interests of technology suppliers in developed countries.

(3) Insistence on the adoption of a full-fledged agreement on intellectual property rights under the auspices of the General Agreement on Tariffs and Trade (GATT), embodying substantial norms and standards to be adopted and enforced by all participating countries. The striking features of these proposals are as follows:

(a) the absence of any reference to the link between the granting of intellectual property rights and the promotion of domestic technological development.

- (b) failure to adequately address the abusive use of intellectual property rights.
 - (c) the resulting substantial administrative and financial burdens that the proposed enforcement measures would impose on developing countries.
 - (d) the loss of GATT concessions and benefits for countries unable to enforce the proposed measures.
- (3) Linking of eligibility to avail of preferential trade concessions such as those granted under the Generalised System of Preferences (GSP), to intellectual property protection. . In another demonstration of the abuse of economic strength, the governments of developed countries are hanging the threat of withdrawal of GSP concessions over developing countries whom they perceive as "inadequately" according protection to intellectual property.

From the foregoing developments, it is clear that the understanding which had developed through the years between technology recipients, technology suppliers, and developing countries that technology transfer is a negotiation where the

host country's right to set up national rules and regulations for a more effective and efficient transfer of technology is recognized is now being eroded. Various international fora had recognized the sovereignty of nations to adopt local legislations on technology transfer taking into account the special needs of developing countries in this area. Now, it would seem that some technology suppliers are bringing in their home governments as a fourth party to the tripartite negotiation among technology supplier, technology recipients and the host governments.

We can only surmise that the negotiations can only tilt in favor of much stronger clout of the home governments of the technology suppliers. What is ironic is that the instigation do not come from bonafide technology suppliers which have been most cooperative in the felt needs of developing countries, but from trademark owners who are licensing technology with their trademarks.

Some developing crisis are now in a debt crisis and foreign exchange payments for trademarks and non-essential technologies do not figure in their priorities. Yet, surprisingly, controls imposed by some developing countries on technology fees for such non-priority items are being viewed as a trade restraint. Free trade assumes free competition, but such does not exist in technology transfer where there is a monopolistic power lodged in the technology

supplier by virtue of its ownership of inventions and technology which are not usually traded in the market place like ordinary commodities. The lumping of technology transfer as a trade issue erodes the developmental jurisprudence that had been built through the years on technology flows. Even trade issues recognise special and differential treatment for developing countries. It is our hope and expectation that technology suppliers and their respective countries will play fair and give due recognition to developing countries' right to chart their own course in determining the type of technologies to import.
