# Perspectives on Developing Nations

*Some findings as to what can and what should be done to help less-developed countries obtain more technology*

**BY WILLIAM H. TANAKA***

I wish to congratulate the sponsors and the organizers of this LES International Conference for having taken up for discussion the problem of "Contrast between technology as offered by the industrialized countries and as required by developing countries: Possible Solutions."

In my view, this problem belongs to those paramount issues which, unless solved in an effective manner, may seriously hamper the future growth of technology trading between the industrialized and the developing nations. One will recall the Lima Declaration and Plan of Action adopted at the Second General Conference of UNIDO in 1975, which decided that the share of the developing countries in the overall world industrial production should achieve the level of *at least* 25% by the year 2000, or within the period of a quarter of a century. According to the projections of UNIDO, this means that during the next 25 years, the total industrial production of the developing countries would have to reach the level of the total world production as *of today*. In 1975, the developing countries had a share of some 7%, and this has to be raised to 100%, or 14 times its present scale within the time-span of 25 years! And if one considers the role which the transfer of technology has to play in industrial development, it is not difficult to recognize what work has to be carried out — both in the developing and the industrialized nations.

### Volume of Trading

Now, let us for a couple of minutes concentrate on the volume of trading in technology in the world; and the share of the developing countries in this process. According to UNIDO estimates, the annual world turnover of technology transfers has reached the amount of about US$11 billion by the year 1975. Compared with the figures of 1965, which were at the level of some US$2.5 billion, a significant increase has taken place. On a very conservative assumption that the same rate of growth would be attained during the following current decade of up to 1985, the world turnover would be somewhere between US$40 to $44 billion.

During the period 1965/1975, it is estimated that the developing countries had a share of about 10% or some US$1 billion, the figures as of 1975. With the expected increased rate of industrialization in the developing countries as called for by the Lima Declaration, UNIDO estimates a growth in the share of technology transfers to the developing nations of about 13-15%, or in absolute figures, some US$6 billion. This is six times the figures as of 1975. (From this, one can rest assured that the business possibilities of the distinguished members of LES, indeed has very bright prospects!)

Let us go still a bit deeper into analyzing the "pattern" of the technology flow. One can clearly see the leading role of the USA as the main supplier of technology, accounting for some 55-60% of the total. About 80% of the total turnover takes place between and among the industrialized countries, whereas the remaining 20% is being almost equally shared between the developing countries and the socialist countries of Europe and the USSR. Now, looking into the sources of the technology supply, there seems to be a very clear-cut indication of a heavy concentration on the transnational corporations, which holds an 80-90% share of technology acquisition of the developing countries, and about 60% of the trading between and among the industrialized nations.

This short analysis of the current situation of the technology trading in the world, in my mind, offers very significant conclusions which should be taken into consideration when approaching the main theme of this panel discussion.

### Still Dependent

First, as the matter stands, the developing nations will still be overwhelmingly dependent on foreign technologies, during at least the major part of the coming decade.

Second, a large portion of the technological needs of the developing countries will be met by those technologies developed in, and flowing from the industrialized countries.

Third, most of the technology supply sources will be transnational corporations.

Now the problem is, what can be done, or what should be done, by the world community — at the governmental level as well as at the industry and private-sector level — to see that the technology transfer flow to the developing nations can bring a positive impact



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on the industrialization efforts of these countries with the ultimate aim of achieving the target of 25%?

### Three Measures

I believe that there are three basic and important measures which could help. They are:

1. Strengthen the local technological capabilities in the developing countries.
2. Lay emphasis on the possibilities of offering alternatives of appropriate technologies suitable for satisfying the development objectives as well as the socioeconomic environment in the developing countries.
3. Encourage and promote a closer and effective system or mechanism of international cooperation between the developing and the developed countries, at all levels, on an equal and mutual beneficial basis.

Technology transfer is a term which has gained so much popularity in recent times that it is often taken on the light shoulder and mistakenly interpreted as if it is the ultimate goal of an exercise. I believe that it should be strongly and correctly recognized that technology transfer is a means and not an end in itself — that technology transfer is an important element of promoting industrialization, but alone will not promote the industrialization.

Transfer of industrial technology is done to create production activities, in our particular case, in developing countries. Therefore, unless the technology transferred is fully absorbed and correctly applied to the conditions in the developing countries, it cannot be expected to bear fruits successfully.

The absorption and the application is a matter which responsibility lies in the hands of the developing countries themselves. The subsequent logic is that the developing countries should lay more and more emphasis on the improvement and strengthening of their technological capabilities to absorb and correctly apply the acquired technologies. This does not mean that they should be left alone on their own to do so.

Here comes in the important role which the developed nations can and have to play. I might compare it with a big family, composed of the parents, and a number of brothers and sisters, grown up as well as small babies which were just born or those just now starting to learn how to walk, eat, play ball games and ride bicycles. The younger ones are taught, guided and supported by their older family members.

### Advantages

Such technological capabilities will also enable the developing nations to carry out necessary activities to adapt the acquired technologies, and further develop them, maintaining close contacts with the technology world which is progressing with such temendous pace and speed. The strengthening of the technological capabilities of the developing countries will help them to take the matters into their own hands, to take charge of their own responsibilities, and make them less dependent to the industrially-advanced countries.

The technologies developed in the developed countries, and particularly those of the large transnational corporation, usually have different aims and objectives, and therefore may not necessarily fit into the environmental conditions of the developing nations. This means that the technologies will have to be adapted, in various degrees, appropriately to meet these conditions, and this in my view would require close collaboration efforts both by the licensor and the licensee.

Here, I would like to throw in some observations which we in UNIDO hold regarding "appropriate technology." We in UNIDO feel that appropriate technology is not a static type of a technological hardware, but something that is based much more on a dynamic concept. The appropriateness of a technology should be considered in terms of its appropriateness for achieving one or more objectives laid down by the policy makers.

These objectives might be, for instance, to increase more labor opprtunities, or to save it, or to produce goods at a quality standard and design level which could compete in the world market, or to be used in a rural, underdeveloped area where the industrial infrastructure and — as I refer to it — the "industrial atmosphere" is still to be developed, or dependent upon the availability of water or fuel or any other inputs that may be abundant or scarce.

In other words, instead of referring to "an appropriate technology," we prefer to use the concept of "an *appropriate choice* of technology." In order to enable an appropriate choice, an opportunity should be provided through an increased flow of information, giving the various alternatives that may be considered.

### Most Important

To the third problem, which in my mind is most important — is to encourage and promote international cooperation. I believe that some effective and efficient system or mechanism should be developed to enable and encourage closer contacts and dialogues between and among the two partners, in the developing and the developed nations, or among the developing nations themselves. As mentioned earlier, technology transfer has its ultimate aim to promote the industrialization process of the developing countries. Industrialization means to create industries which will start industrial production; and industrial production is a business affair. I therefore believe that system or mechanism to promote contacts and dialogues should be conceived in a businesslike manner. And, since business is something practical and down-to-earth, one should not go only for theories and ideas, or "slogans" if one may say, but remain realistic and follow a pragmatic path of process.

In all the three described cases, UNIDO as a neutral body is trying to act as a catalyst to initiate activities that may contribute to one or more of the problems. If I may be allowed to touch shortly on this, for instance, UNIDO has initiated a kind of an advisory group called *Consultative Group on Appropriate Industrial Technology*, to give advice to actions to be taken by UNIDO in the field. The *International Forum on Appropriate Industrial Technology* scheduled in India from 20-30 November 1978, will be organized on the government-ministerial level through the participation of some 30 ministers, and on the practitioner's level through top experts and eminent persons from business corporations, private organizations, institutions and universities. The objective of the forum is to draw up action-oriented programs through which appropriate technology can be assimilated into the mainstream of industrial development and serve as a basic tool for the achievement of development objectives.

UNIDO took steps in mid-1977 to create the Industrial and Technological Information Bank (INTIB) to increase the flow of information relying heavily on its effective links with the suppliers and users of technology and technological information. A Technological Advisory Service was recently initiated to provide short-term advisory services for the acquisition of technologies. UNIDO has been giving such assistance in selected cases on basis of its own experience as well as through top-class experts and in a number of cases from LES.

### Framework

The Cooperative Program on Appropriate Industrial Technology was designed to provide a framework of international cooperation in this field. Urging anybody and everybody, within or outside the United Nations, government or private companies or individuals, to move in more actively into this most important field of industrial development through technology development and transfer. We also have a sectoral consultation system, or a program of ECDC. I suggest that, if you need further information on UNIDO's work program, please contact UNIDO or me.

I would like, once again, to emphasize the important role which an organization such as the LES International could, and should, play. In each of the three areas I have mentioned, plus of course many, many other aspects, LES as a society, or in the capacity of individual members, could contribute so much to assist and help the efforts of the developing countries. Business is a serious matter — I remember someone telling me once that it is a matter of "live or die." But I also remember having read a book whose title was "live and let live." One may look at it from the viewpoint that the stronger one's partner becomes, the better the chances for more business.

Coming back to the subject of technology appropriateness, let us look into the matter of the needs of developing countries, or as the panel sub-theme expresses it, "technology as required by the developing countries." We should not fail to distinguish between the different groups of developing countries, those which are less or more advanced, those benefited by natural resources, and then those considered within the U.N. as the least developed of the developing countries.

The needs of the more developed of the developing countries are, or will be in the near future, more compatible to the needs of the industrialized countries, at least in terms of the technological level and sophistication. However, their social and economic objectives may differ substantially.

The less-developed and particularly the least-developed group of countries will have entirely different needs, stemming from the necessity of meeting the basic needs — food, clothing and shelter. The level of technological capabilities may still be somewhat on the lower level, and this would indicate that they would require relatively simple, low-cost and perhaps but usually more labor-consuming technologies. Those countries with more natural resource endowments might wish to go into highly-modernized technologies to satisfy the demands of the world market.

In short, the needs and requirements of the technologies would vary from top to bottom. But one thing is sure. It will call for an enormous amount of resources — foreign currencies — to meet their technological needs. As observed before, it may total US$6 billion.

### Specific Requirements

In order to face the above problems, it cannot be over-emphasized that the technologies to be transferred to the developing countries should be adapted as much as possible to the specific requirements, and, at least until a sufficient degree of technological capability is developed in the developing countries, under joint efforts by the licensors and the licencees.

One more matter which I would like to refer to is that we believe it is high time to mobilize the medium and small industries in the developed countries, and find ways and means of getting them to more seriously participate in the technology transfer process to the developing countries. Usually, these medium and small industries are a lot more flexible in adapting their offers to the specific needs of the technology receivers or the prospective licencee. Furthermore, they are less restricted by policies and interests of global nature. This enables their offers of technology to be based on terms and conditions more campatible to the objectives of a large number of developing nations.

### Closer to Needs

Of course, we may also not neglect the fact that the medium and small industries often do possess technologies which are not far from the specific requirements of the developing countries, thus calling for a lesser degree of adaptation. I might mention that UNIDO is formulating a program which is aimed at promoting a more active involvement of these types of industries.

Finally, I wish to express another hope — that the transfer of technology between and among developing countries, as well as such flow from the developing to the developed countries, should be encouraged. In the former case, a relatively advanced partner may already have a technology adapted from a more advanced status, to suit their needs, and these might be applicable on a ready-made form for other developing countries following the same path.

I wish to reemphasize my conviction that the LES International is in a position to play an important role in the transfer of technology for the benefit of the developing countries. With a common base of objectives, UNIDO and LES have already carried out a number of joint activities. These were accomplished on the LES level such as the joint LES/UNIDO meeting in

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