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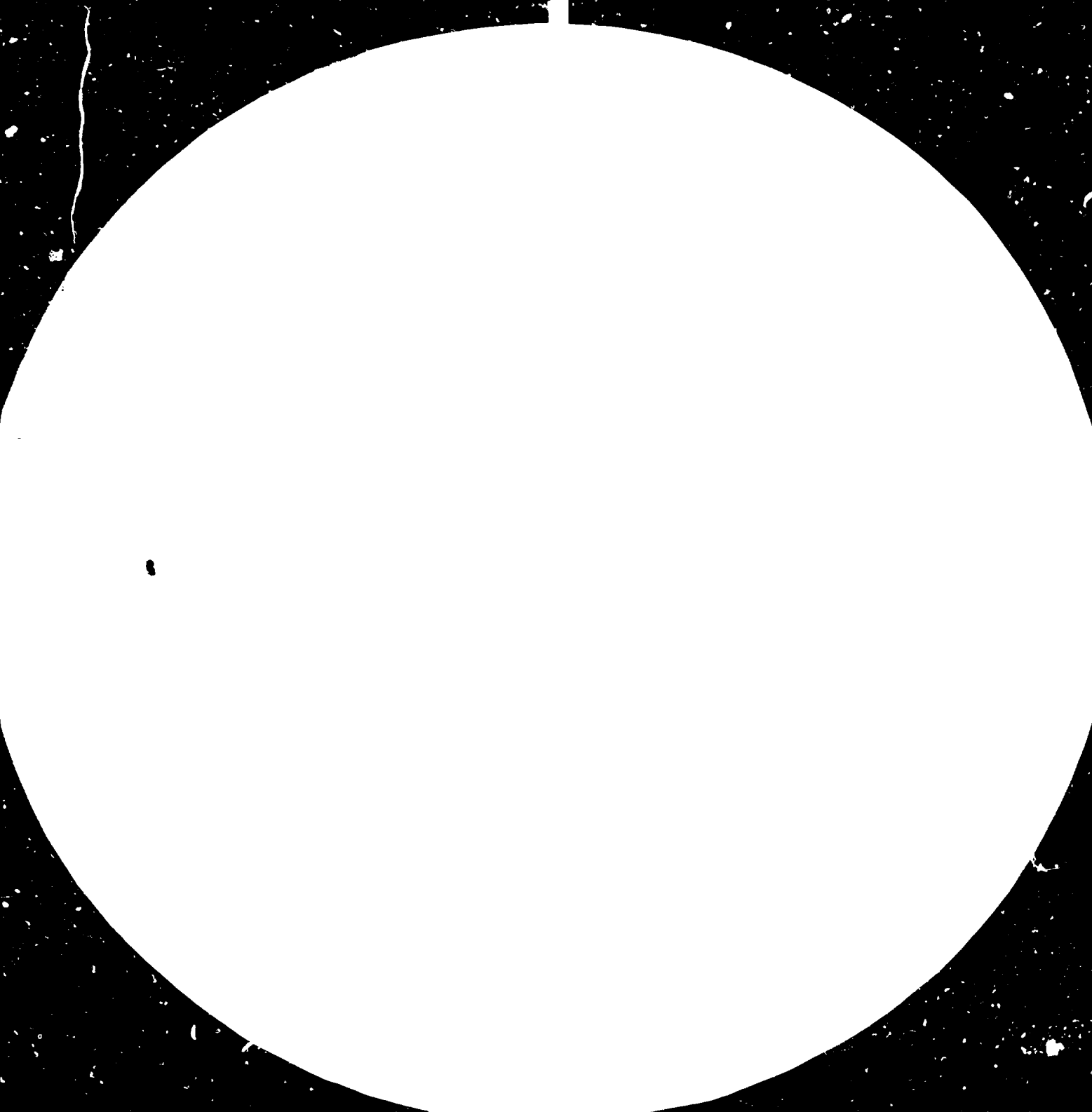
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OVERVIEW OF SELECTED PROBLEMS
OF
TECHNOLOGY TRANSFER TO DEVELOPING COUNTRIES *

by the UNIDO Secretariat

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INTRODUCTION

This paper is intended to provide a historical perspective of technology transfer into developing countries in the last 15 years, to map certain visible trends in this process, single out major actors of technology transfer among suppliers and recipients of technology, outline and describe basic problems which still exist in this area and attempt at charting key issues and directions of technology flows in years to come.

The material which has been used to prepare this paper has been received, in the majority of the cases, from the Technological Information Exchange System (TIES) operated by UNIDO, from the experience of UNIDO's Technological Advisory Services (TAS) and from information supplied by developing countries.

We have also used, to the extent possible, some material published by Les Nouvelles, Journal of the Licensing Executive Society.

OVERVIEW OF TECHNOLOGY TRANSFER TO DEVELOPING COUNTRIES

The flows of technology to developing countries in principle, are effected by the way of direct foreign investments, the supply of equipment, machinery and turn-key plants (embodied technology), setting of joint ventures and licensing of patented or non-patented know-how.

In view of the fact that this meeting is organized jointly with LES, this paper will deal predominantly with joint-ventures and the supply of patented and non-patented know-how.

While probably the majority of the flows of technology are taking place by way of supply of equipment and machinery and by way of direct foreign investment, the supply of know-how or licensing, both in terms of absolute volumes as well as its importance as an effective vehicle for direct transfer of technology increased considerably.

The following table provides basic data on the growth of flows of technology (in form of royalty payments) in selected development countries in the period 1965 - 1981.

TABLE I (all payments in million US \$)

<u>Country</u>	<u>1965</u>	<u>1970</u>	<u>1975</u>	<u>1977</u>	<u>1978</u>	<u>1980</u>	<u>1981</u>
Argentina		115.8	78.0	37.9	157.9	581.8	579.9
Brazil	43	104.0					
Mexico	65.6	125.7					
Venezuela ^{1/}	14.8		81.0 ^{2/}				110.0
India		49.6 ^{3/}					
Rep. of South Korea		2.4	18.5	67.2	94.6		
Philippines							
Portugal		12.0 ^{4/}	20.1 ^{5/}	25.3	23.0	21.0	32.3
Spain	79.9	155.0	258.2	428.8	454.3		

^{1/} - 1966 ^{4/} - 1972
^{2/} - 1976 ^{5/} - 1974
^{3/} - 1969

Source: Data received from technology registries of countries surveyed

As can be clearly seen, the above group of selected developing countries imported in 1965 technology worth of ca. 200 million \$ while their imports increased in 1975 to the amount of ca. 1 billion and in 1980 reached the sum of ca. 2 billion \$.

Even taking into account two devaluations of the dollar which took place in this period of time and an average world inflation rate, the increase in flows of technology is extremely impressive and supports the theory that the developing countries are becoming more and more an important market for the technology developed in the industrialized world.

While in 1965 their share in the world turnover of technology accounted barely to 8%, in 1980 it has reached the impressive 14% and is expected to accelerate even faster in years to come. This rapid growth can be attributed on one side to the overall economic growth, and on the other to industrialization efforts undertaken by the Government in those countries.

Another important feature of technology flows to developing countries is the fact that those flows are decisively coming from transnational corporations (TNC).

It is estimated that while TNCs share in the world technology turnover oscillates between 60-70%, it represents around 90% of the flows to developing countries.

In this context one should mention that a great deal of this flow goes into subsidiaries of TNC, both fully owned as well as majority and minority owned.

While originally in the process of technology transfer we used to deal with licensee and licensor, since early in the 1970s, one should add a new and important actor, that is the Government.

This holds true for all major developing countries, although we witnessed an increasing role of Governments in technology development and transfer as well as in industrialized countries.

The presence of Governments in the technology transfer process constitutes an important feature of technology transfer in the late seventies and appears to be even more visible throughout the eighties.

THE ROLE OF GOVERNMENTS IN THE TECHNOLOGY TRANSFER

As mentioned earlier, the Government became an important factor in technology flows to developing countries.

One should however not overlook that the role of Governments, as an important economic stimulator, has been introduced both in Europe and the USA in the years of the Great Crisis 1930s and since then its role only increased.

There is also no doubt that Governments played a significant role in the rapid technological development of the USA and Western Europe and the years following the Second World War (not mentioning the centrally planned economies of the Soviet Union and other COMECON countries).

Postwar Japan went through a very strict control over the imports of technology, which only recently, some years ago, has been gradually removed.

Again it was the USA that by the end of the XIX century introduced the first antitrust legislation which, at present, is being rigorously applied to regulate the conditions under which the transfer of technology takes place in the US but also in the EEC countries and Japan.

As the developing countries began to realize that their strive for a better standard of living of their people and accelerated social and economic progress required a mobilization of resources by their Governments, they began to gradually introduce such policy instruments which ultimately led into a growing state intervention in the economy. Such growing role of the Governments led, logically, into the regulation of both, foreign capital inflows and foreign technology inflows.

While at the beginning of those various regulatory measures they aimed primarily at the protection of the national industry, with the passage of time and with the experience, they gradually evolved into more complex technological policy, aimed at the development of a national technological base.

As we deal with technology transfers at this meeting, let us outline major and direct conditions which lead to regulatory measures in this area. Those are:

- the outflow of foreign exchange in the form of technology payments;
- the conditions of technology transfer transactions
- the need to secure relative technological independence by those countries.

The conditions of introduction of regulatory measures seem, still today, major problem areas for the flow of technology to developing countries.

One should not overlook however the fact that the regulatory measures by developing countries, also in this area of technology flows, were based on the experience and examples of such countries like Japan, US and all Europe.

OVERVIEW OF MAJOR PROBLEM AREAS OF TRANSFER OF TECHNOLOGY TO DEVELOPING COUNTRIES

It seems both from the literature and direct contacts with licensors and licencees that the following will appear to be major problem areas in flows of technology to developing countries:

- 1.- regulatory measures introduced by developing countries;
- 2.- issues related to pricing of technology;
- 3.- lack of information at the end of would-be licensors and would-be licencees.

Let me describe in more detail all of the above outlined major problem areas.

No doubt that the regulatory measures introduced by Governments of all major importers of technology among the developing countries touched the wave of bitterness and protests at the side of suppliers of technology

These problem areas in this field could be divided into two major categories:

- (a) interpretation of restrictive practices and,
- (b) active role (in some cases) of Governments in contract negotiations.

As regards interpretation of restrictive business practices, in our view at least, it follows rather closely the interpretation applied by courts in all countries with antitrust legislation although on different grounds.

While the purpose of the antitrust legislation is to prevent one party to ascertain monopolistic market positions and thus harm the consumers, the developing countries are attempting to protect their own industry, a "consumer" of technology supplied often by monopolistic or oligopolistic licensors.

As an illustration for similarities in the interpretation of the most obvious restrictive business practices, please find data in the following table.

TABLE 2

Type of restrictive provisions	<u>US</u>	<u>COLOMBIA</u>	<u>MEXICO</u>	<u>PHILIPPINES</u>	<u>JAPAN</u>	<u>INDIA</u>	<u>PORTUGAL</u>	<u>SPAIN</u>	<u>EEC</u>
TIE - IN	illegal "per se"	illegal	illegal	illegal (exceptions possible)	illegal (acc. F TC guidelines)	illegal	illegal	illegal	illegal in princ.
Restriction on Licensee's right to deal in Competitors' Product (TIE - OUT)	illegal "per se"	illegal	illegal	illegal	illegal (with exceptions)	illegal	not mentioned specific.	illegal	illegal
Mandatory package licensing	illegal in princ.	not ment. spec.	not ment. specif.	not ment. spec.	not ment. specif.	not ment. specif.	not ment. spec.	not ment. specif.	illegal
Post expiration royalties (patent + licence)	illegal "per se"	illegal	illegal	illegal	not ment. spec.	in princ. illegal	not ment. specif.	not ment. spec.	illegal
Price fixing restrictions	virtually illegal "per se"	illegal	illegal	not ment. specif.	illegal	in princ. illegal	illegal	illegal	illegal
Quantity of volume restrictions	US Dep't. Justice illegal "per se" Court decision varies	illegal	illegal	illegal	not ment. specif.	not ment. specif.	illegal	illegal	not ment. spec.
Territorial restrictions	determined by rule of reason	illegal	illegal (exceptions possible)	illegal (exceptions possible)	may be declared illegal	illegal in princ.	illegal	illegal in princ.	illegal

Source: National Legislation of Selected Developing Countries
National Approaches for the Acquisition of Technology - ID/187

Another area which naturally causes lots of problems is the overall and perhaps eternal question of pricing of technology where usually the licensee is charging that the licensor is overpricing, either directly or indirectly.

UNIDO is far from the position to solve this problem, nor regulating measures of Governments being in a position to put down the price by an artificial setting of royalty rates.

In some of our publications ^{1/} we have proposed certain methods of royalty and payment appraisal based on expected profit, the licensee is likely to make on a basis of acquired technology, and we believe that those methods give a fair deal to both parties.

The UNIDO's Technological Information Exchange System (TIES) is also designed to assist in obtaining fair bargains. On the outset, it seems that although this area will remain full of "problems" in terms of individual transactions, on the whole the situation has been improved gradually over the last 10 or 15 years.

The major problem, in our view will remain however, as far as it concerns the lack of information on would-be licensors and licensees, starting with general information on the country of either of them and ending with details on licenced technology.

We believe that mutual prejudices and the simple lack of knowledge and information is causing major problems which we believe LES is in a

1/ See for example: ICIS/51; ID/223

position, in joint effort with UNIDO, to solve over a certain period of time.

CONCLUSIONS

As indicated earlier, UNIDO is of the view that a continuous dialogue between LES and the developing countries in such a form as today's meeting contributes towards the gradual elimination of problem areas in flows of technology to developing countries.

We hope that this meeting, following earlier discussions held in New York, Lisbon and Helsinki, will be continued and that by the joint effort of technology transfer will contribute towards a better mutual understanding and economic progress.

In our view the developing countries constitute the largest potential market for technology in years to come and mutual interdependence will force such exchange even stronger in the future.

