



TOGETHER
for a sustainable future

OCCASION

This publication has been made available to the public on the occasion of the 50th anniversary of the United Nations Industrial Development Organisation.



TOGETHER
for a sustainable future

DISCLAIMER

This document has been produced without formal United Nations editing. The designations employed and the presentation of the material in this document do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations Industrial Development Organization (UNIDO) concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries, or its economic system or degree of development. Designations such as “developed”, “industrialized” and “developing” are intended for statistical convenience and do not necessarily express a judgment about the stage reached by a particular country or area in the development process. Mention of firm names or commercial products does not constitute an endorsement by UNIDO.

FAIR USE POLICY

Any part of this publication may be quoted and referenced for educational and research purposes without additional permission from UNIDO. However, those who make use of quoting and referencing this publication are requested to follow the Fair Use Policy of giving due credit to UNIDO.

CONTACT

Please contact publications@unido.org for further information concerning UNIDO publications.

For more information about UNIDO, please visit us at www.unido.org

We request that you sign the page of this report to be
returned to us by mail or by hand to the proper
office to which it should be sent. The first page of
this report is printed on the reverse side.



08124



United Nations Industrial Development Organization

Distr.
LIMITED

ID/WG.275/4/Rev.1
23 May 1978

Original: ENGLISH

**Meeting of Government Experts on
Regulatory Functions in Transfer of Technology**

Vienna, Austria, 29 May - 2 June 1978

Agenda Item No. IV

**SURVEYS ON THE IMPACT OF FOREIGN TECHNOLOGY IN
SELECTED COUNTRIES AND PRIORITY SECTORS^{2/}**

prepared by

the Secretariat of UNIDO

^{2/} This document has been reproduced without formal editing.

14.78-2571

C o n t e n t s

	<u>Page</u>
I. Introduction	3
II. Planning for National Technological Development	3
III. Major Elements to be considered in the Country Surveys	5
IV. Choice of Countries	7

I. INTRODUCTION

1. Through the issues it has helped to raise, the phrase "transfer of technology" has proved its usefulness as well as limitations in describing the technological requisites of developing countries. In its strict meaning, and for some time in the past, the phrase meant very largely that part of the process of the flow of technology where technology is acquired through a contract. It has become rapidly clear, however, that the flow of technology to an enterprise involves a much larger process and wider and deeper implications. The flow itself takes place through several stages such as selection, acquisition, adaptation, absorption and development and re-transfer; and the implications of this flow extend far beyond those of the discrete independent transactions that occur between the enterprises. Consequently, the emphasis has shifted from considerations of technology transfer, which is a flow concept, to that of development of technological capabilities, which is a stock concept; also most of the developing countries have emphasized as one of their significant development goals the development of national technological capabilities. Therefore, any study dealing with the impact of foreign technology will have to relate to the positive and negative effects on the overall development of national technological capabilities.

II. PLANNING FOR NATIONAL TECHNOLOGICAL DEVELOPMENT

2. The phrase "technological capabilities" means the capabilities for the choice, acquisition, adaptation, absorption and development of technology. The task of building up the technological capabilities is obviously a task spread over time and over many fronts. The essential planning ingredients for developing national technological capabilities comprise:

- (a) The identification and monitoring of technological needs and objectives;
- (b) The development of an adequate technological infrastructure, including a comprehensive information system and the growth of technological service capability and specialized manpower skills;

- (c) The creation of institutional mechanisms for evaluation, selection and acquisition of technology considered most appropriate in a given set of circumstances;
- (d) The establishment and development of appropriate institutional mechanisms for monitoring the impact, absorption and adaptation of various processes and techniques;
- (e) The growth of R and D activities in significant industrial sectors and in basic infrastructural fields such as energy, in close linkage with industrial activities;
- (f) The defining of policies and guidelines in terms of fiscal or regulatory instruments to encourage indigenous technological development and to ensure adequate inflow of appropriate foreign processes and techniques in critical priority sectors.

These aspects are closely interlinked and though the institutional and policy mechanisms may be covered by several institutions and instruments, an essential feature of technology programming is to effectively dovetail the functioning of such mechanisms so that the various basic issues receive adequate consideration.

3. Together with the framing of a technology plan, it is necessary to consider the various policy instruments which can play a significant role in technological change. These can take various forms including national laws and regulations for licensing of production capacity of industrial enterprises, or the defining of pioneer industries, controls over majority foreign equity holdings, employment of expatriates, controls over imports, incentives for export and import substitution, regulatory control over foreign technology, regulations control over foreign technology, regulations for use of domestic consultancy agencies and technical services, various forms of financial assistance and incentives for small-scale and rural industries and the like. Fiscal and regulatory instruments have often to be utilized in combination with one another.

4. Policies and instruments relating directly to technology have to be viewed within the framework of overall economic and industrial policies. By and large, however, such policies and mechanisms need to be defined in respect of (i) the role of foreign investment, both existing and new;

(ii) fields in which foreign technology is considered particularly necessary, including measures designed to ensure adequate flows, including tax benefits; (iii) production and service sectors in which foreign technology should not be encouraged, including technical and management services, merchandizing and internal sales and sectors where domestic capability is either adequate or should be developed; (iv) the establishment and development of a regulatory mechanism to regulate such inflow in accordance with prescribed and well defined guidelines; (v) incentives and measures to encourage domestic technological growth, including tax rebates for R and D expenditure, limited duration of foreign technology agreements, etc; (vi) incentives and measures to promote domestic technological services, particularly consultancy and engineering services including tax relief and regulatory action such as insistence on local consultancy agencies being appointed as prime consultants in selected fields; and (vii) financial assistance and support to domestic technology agencies. Such a list of policy measures and instruments relating directly to technology can only be illustrative and not exhaustive and must be formulated in the context of each country or region.

III. MAJOR ELEMENTS TO BE CONSIDERED IN THE COUNTRY SURVEYS

5. The overall assessment of the impact of foreign technology will thus have to relate to its positive contributions to the development of national technological capabilities in general and to the promotion of technological development in specific industrial sectors. Thus, in regard to the more general part, the following elements have to be examined as they individually or collectively contribute directly to technological development. These include the following:

- (a) Consistency within the country in respect of acquisition of foreign technology with industrial strategies and policies particularly with regard to dispersal of industries, rural industrialization programmes notwithstanding the development of basic industries such as capital goods including engineering, electrical and transport requirements;
- (b) Promotion of domestic technological services, particularly consultancy and engineering services;
- (c) Development of overall production capacities, particularly in the capital goods sector;

- (d) Promotion of research and development efforts in selected priority sectors;
- (e) Access to use of licences and patents already acquired by other enterprises;
- (f) Payments made for the acquisition of foreign technologies and their relation to overall balance of payment situation and particularly to foreign exchange; and
- (g) Inflow of technologies in relation to the type of ownership of enterprises.

5. Such a study will provide an overview of the impact of acquisition of technologies on the national economy, bearing in mind the contribution they make to the national technological capacities. However, the sectoral and specific industry studies provide a greater insight as to how technologies have been chosen and assimilated into the total industrial fabric. They also provide a valuable insight into the decision-making process itself, which in most of the developing countries is not fully integrated. Furthermore, the effort to regulate the import of technologies is not limited to a few developing countries but also the link of the work of such regulatory agencies is not fully dovetailed into a national technology policy. Nevertheless, the detailed sectoral studies would throw light on the manner of choice, method of absorption and measure of innovation of imported technologies, if any. Such studies could also throw a light on the total flow of foreign technology into the industrial system and particularly its impact on the elements of technology capability at the sectoral level including the entire process of negotiation and terms and conditions of such acquisition. The sectoral study of selected industrial branches would thus cover the following points:

Acquisition of foreign technology:

- Choice of alternatives and the agency entrusted to make the initial search and selection;
- Choice of collaborators;
- Terms and conditions of agreement;
- Choice of products, particularly technologies for such products;
- Conditions relating to acceptance and performance tests.

Absorption and adaptation of technology:

- Manufacturing process;
- Assimilation of design know-how and related R and D efforts;
- Further development of technology and its incorporation into the production process;
- Development of special skills.

Contribution to other sectors:

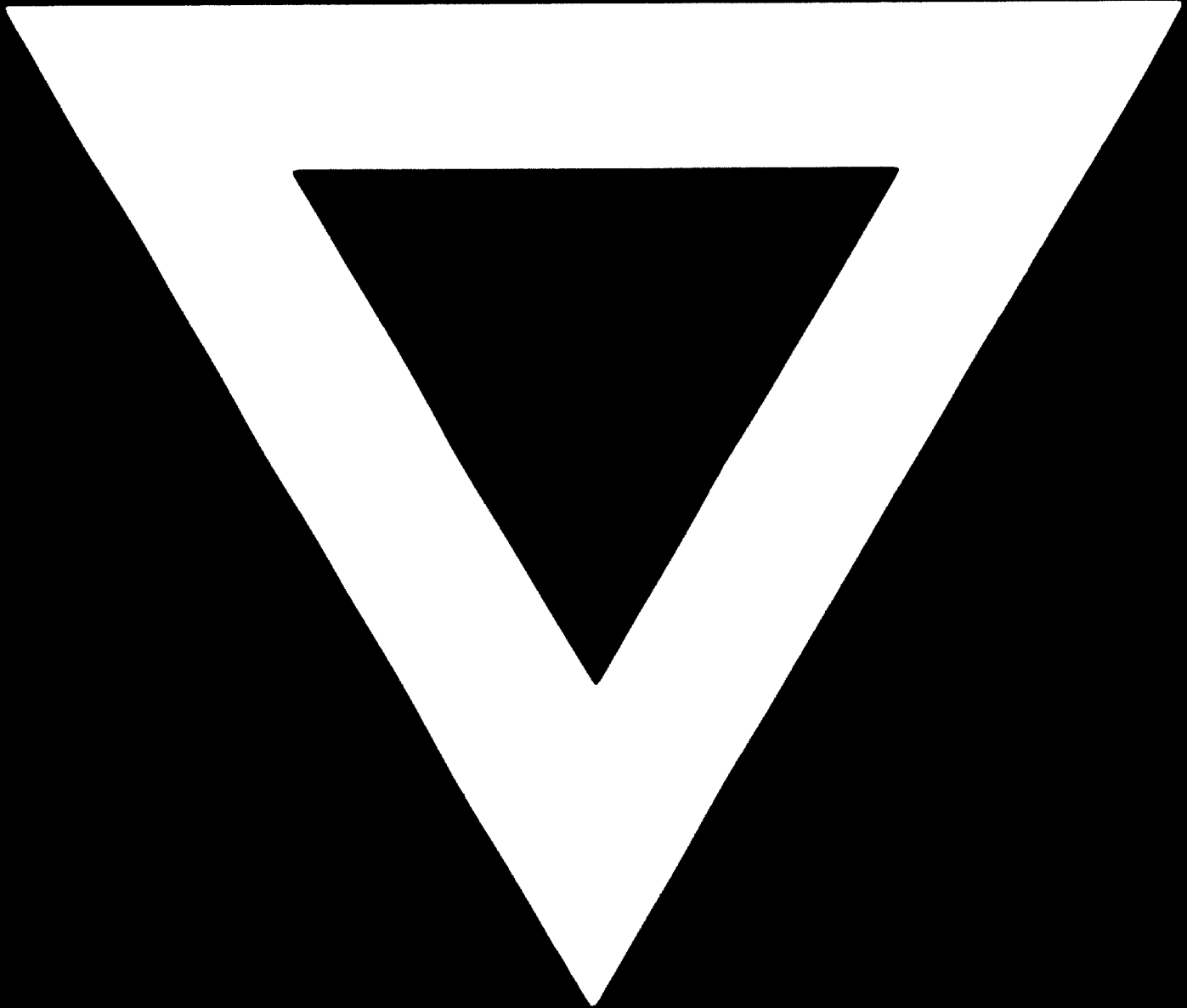
- Further provision of know-how;
- Training facilities for other related establishments;
- General observations on terms and conditions.

The number of sectors to be chosen in each country will depend on the importance of the sectors and particularly the relevance of such experience in improving the entire structure of acquisition and assimilation and in enhancing the technological capacities in related industrial branches. UNIDO, in consultation with the relevant authorities in the countries, will select specific sectors of special importance in each country.

IV. CHOICE OF COUNTRIES

7. It is suggested that some ten countries be selected for undertaking both general and industrial branch studies. The selection of countries should take into account three types of experience, namely countries who have made deliberate efforts to acquire technology, on a selective basis, countries which continue to be industrially very underdeveloped and where basic industrial and technological infrastructure may be very inadequate, and countries at an intermediate stage of industrial development and where efforts are being made to channelize foreign technology to certain sectors. The latter group would include countries such as Columbia, Kenya, Malaysia, etc. in which technological infrastructure is being gradually built up. Assuring the necessary resources, the total time in completing the surveys, including the preparation of conclusions through the expert group meeting such as the present, would take approximately eighteen months.

C-665



78.11.06