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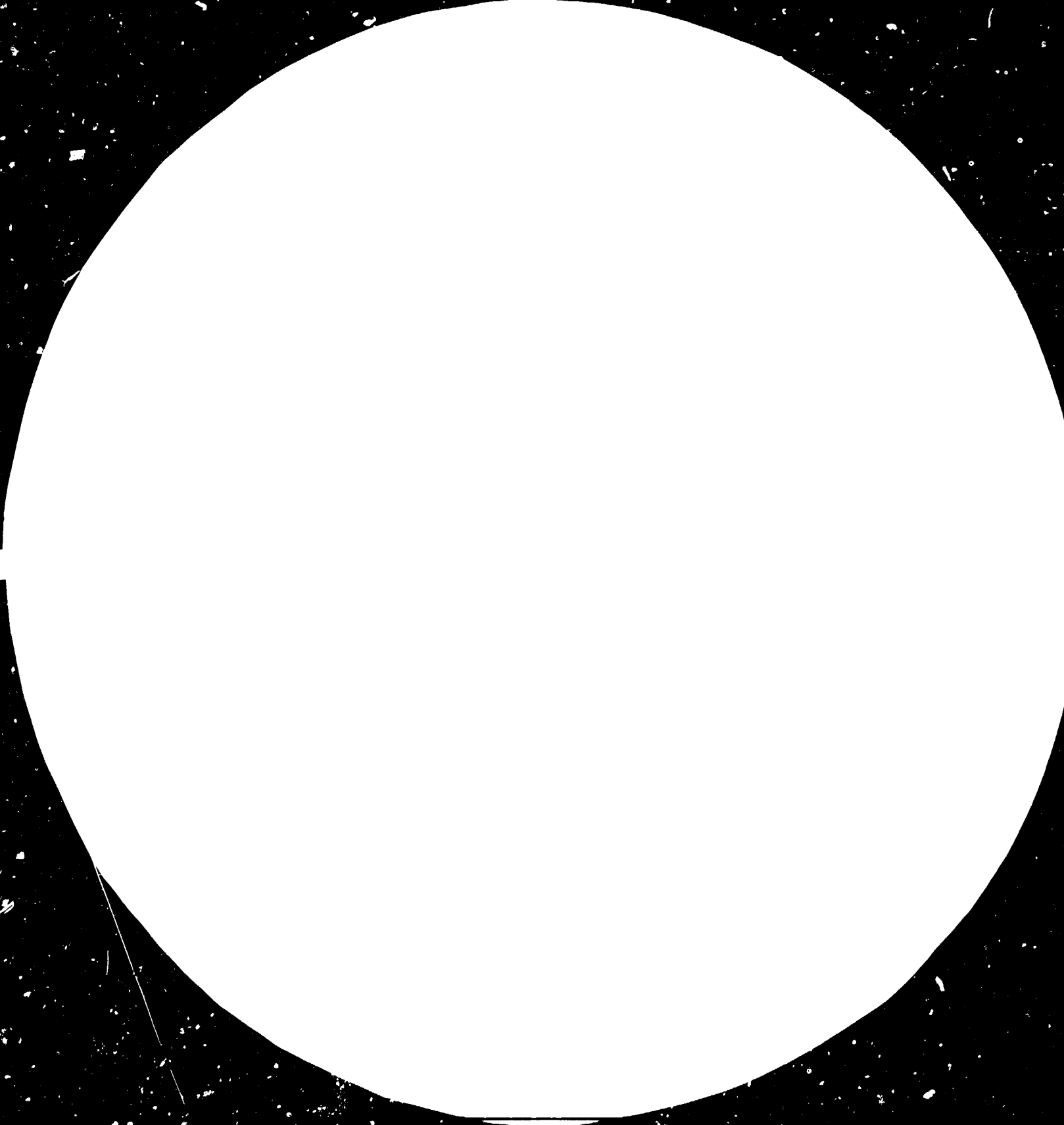
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UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

Meeting of Selected Heads of
Technology Transfer Registries

6-8 July 1983, Vienna, Austria

12644

DRAFT OUTLINE OF THE ANNUAL REVIEW OF

TECHNOLOGY TRANSFER TRENDS

1983

DEVELOPMENT AND TRANSFER OF TECHNOLOGY TRENDS

CHAPTER I - Trends in Economic Development

1. Objectives

a. To meet the varied needs of the different target groups it would be necessary first to describe briefly the economic setting within which each country strives to achieve its economic goals.

b. For this purpose, basic economic, industrial and technological indicators will be presented. Technology has come to be recognized as the critical element in industrial growth, and later chapters will describe in detail the technology flows, their analysis and their linkage with economic development.

2. The indicators presented in Chapter I

The Chapter will only utilize existing published material, and will give an overview of world economic development trends, with special emphasis on the developing countries. The Chapter will not give the detailed statistics. A few indicators will be in the statistical tables - for the rest a reference to where further information can be found. The country group classifications which will be used here and later, would be as follows:

1. industrialized countries
 2. socialist countries
 3. developing countries
 - a. divided into regions
 - b. least developed countries = 36 countries
- A. Indicators of economic development
- GNP (value, rates of growth, per capita income)
 - population
 - literacy
 - distribution of GNP by sectors

B. Indicators of industrial development

- distribution of industrial products by major industrial sectors. Their rates of growth to illustrate as to which are the dynamic sectors
- trade in manufactures (export and import)

C. Indicators of technological development

- R+D expenditures
- trained manpower available (scientific, engineering)
- volume of technology imports/exports

3. Sources of information

UNIDO, UNCTAD, World Bank, UN other regional organizations.

CHAPTER II

Operational strategies and policies towards technological development

Objective

This chapter will be devoted to analysing the ways that developing countries orient their efforts to achieve their technological transformation. It includes information about the different levels that they have reached in the field of technology policy and plans, including instruments and mechanisms that they utilize to translate policies into specific activities. The chapter will be focused in the incidence of the technology policy in the industrial development and will serve as a framework to analyse transfer of technology.

Descriptive parts

1. Principal trends in technology planning

This Chapter will describe different experiences of technology planning to show the state-of-the-art in this field. A systematic approach to the objectives, instruments and mechanisms of national plans will be set out. Based on that information the Chapter could provide some sort of classification of national plans, taking into account:

- a. explicit linkages with national industrial policy
- b. level of definition of national priorities in science and technology
- c. technology indicators utilized for the above
- d. institutional framework
- e. definition of instruments and mechanisms

2. Alternative approaches to evolution of technology policies and plans

These include:

- a. principal objectives
- b. methodological aspects
- c. national co-ordination for planning
- d. linkages to end-users
- e. co-operative arrangements at the national, regional and interregional level
- f. macro and micro-level management.

3. Generation of financial resources for technology

- a. different methods to create fundings:
 - government
 - public enterprises
 - private sector
 - international technical co-operation
- b. industrial finance and technology packages
- c. financial and tax incentives to promote use of locally developed technologies.

4. Technological adaptation, absorption and innovation

Principal trends covering: financing of technical change
technical change and employment

engineering and consultancy services

pilot plants

prototype facilities

5. Marketing of technology

- mechanisms for marketing technologies developed indigenously
- mechanisms for covering risks for first time use of local technology (guarantees)
- use of consulting engineers to transform technology into technology-in-use
- consulting engineering activity to provide information to local R+D institutes or specific needs of industry.

6. Technological information

- the mechanisms for spreading it. The speed and accuracy with which it is made available to users or potential users.
- mechanisms available for international search for technology
- mechanisms and their use of: local inventories of capabilities and the use to which they are put
- informatics and computerization

7. Orientations for technology transfer policies

Principal trends for:

- a. acquisition and choice of technology

- b. principal actions in technology transactions
- c. evaluation of alternatives technologies
- d. public enterprises as instruments of technology induction and diffusion
- e. centralized purchase of technology and horizontal transfer.

CHAPTER III

Legal and institutional framework for transfer of technology

Objective

This chapter will present the manner that the governmental policy environment, including legislative actions, and the institutional infrastructure, interact in the negotiations between licensors and recipient enterprises.

Descriptive Parts

1. Categories and elements of technology transfer

- a. intangible technology
 - patents
 - trade marks
 - industrial design
 - know-how
- b. technical and allied services
- c. engineering and consultancy services

2. Modes of transfer

This includes a brief description of the manner in which the transfer for each element or their combination takes place, e.g.

- pure know-how
- embodied in imported capital goods
- as a part of a turnkey package
- through joint ventures
- by means of production units, etc.

3. Regulation through legislation and administrative mechanisms

Trends in legislations related to technology transfer:

- a. types of legislative framework
 - regulatory only
 - developmental plus regulatory

- b. Administrative mechanisms
 - rules
 - regulations
 - special procedures

c. International framework

- treaties and conventions
- bilateral agreements
- subregional and regional arrangements
- interregional arrangements

d. Scope of legislation

- what activities it regulates and in what manner

e. Review of legislations and administrative procedures regarding key issues
in technology transfer

4. The institutional framework

a. types of institutions engaged in technology transfer regulation

b. their place within the government system

c. internal organization

- registries
- finance exchange control mechanisms
- linkages with R+D or other technology development institutions
- tax bodies and their inter-connection with the technology transfer institutions

5. Characteristics of the regulatory activities

a. evaluation and approval

- approval procedures
- scope of evaluation
- evaluation criteria and methods applied and detailed analysis.

- b. co-ordinating activities
- c. promotional activities
- d. monitoring activities

6. Interaction in the transfer of technology process

Discussions on alternatives, modes of interaction among actors in the technology transfer process, e.g.:

- a. technology recipient enterprise
- b. supplier of technology
- c. institutional infrastructure
- d. government policy and legislative instruments.

CHAPTER IV

Trends in Technology Flows

The objectives of this Chapter are:

- a. to provide in a consolidated fashion basic data on technology flows among countries which are presently being collected and published in piecemeal fashion by a number of organizations
- b. it shall also provide a basis for the conclusions, where interrelationships between various aspects of technology policy, technology development and technology purchase will be tested against different indices of economic development.

Data presently being collected at TIES I level

The types of information collected in the respective table formats, namely:

- TIES I Table 2 - breakdown by collaboration type
Table 4 - by level of foreign holdings
Table 5 - by duration
Table 7 - by royalty rates
Table 8 - by total/ISIC contractual payments
- are annexed.

In addition to the TIES data collection, an attempt will be made to expand data bases with regard to the following:

1. Expenditure on technology imports
 - a. as % of total imports
 - b. as % of total industrial investment

2. Expenditure on technology imports compared with value of production of items manufactured with this technology.
3. a. % of approvals, of the total contracts submitted
b. of the approvals, % implemented, by sectors if possible.
4. Trends in the purchases of technical documentation by ISIC.
5. % of technology contracts which resulted in local R+D.
6. The incidence of restrictive clauses by type e.g. on exports
on sublicencing etc.
7. Impact of the technology import on balance of payments.

No. of contracts by ISIC (if possible)/payments for technology/payments for equipment/payments for raw material/payment for components/turnover.

Empirical studies may have to be used for illustrative purposes rather than definitive/detailed country-wise information because of paucity of data e.g. studies carried out on Korea/Thailand/Philippines.

8. The export orientation of the manufacturing sector, based on imported technology.

No. of contracts by ISIC/payment for technology/turnover for the products/product exports.

Again, empirical studies as at 7 may be used.

9. How is royalty computed - patterns used e.g.
 - a. on whole amount
 - b. or excluding import content from foreign collaborator
 - c. or only on local content.

10. What are the average royalty percentages?
 - a. by industrial sectors
 - b. in a few important products for example automobiles.

11. Prevailing patterns, % of local content in manufactures. Illustrative empirical studies to be used.

12. a. % of total output according to industrial sectors, generated by multinational corporations.
 - b. multinationals contribution to exports from developing countries.

13. Payments for technology as compared with remittances on profits and dividends.

14. Breakup of technology payments by amounts:
 - a. below US \$100,000
 - b. US\$ 100,000 - 500,000
 - c. US\$ 500,000 - 100,000,000
 - d. above US\$ 1000,000,000

15. No. of contracts signed by public sector enterprises by industrial sectors, and their value.

16. Trends in the flows of technological advances - no. of contracts, breakdown by industries, suppliers and recipient countries.

17. Technology flows among developing countries
 - a. no. of contracts, value by sectors
 - b. no. of joint ventures between developing countries, by sectors.

CHAPTER V

Analysis of interrelationships between technology transfer, technology development and economic development

A number of relationships are to be examined:

1. Between economic development, industrial development and industrial diversification (sector wise) and growth, on the one hand, with:
 - a. the number of technology transfer contracts, and their value
 - b. the role of foreign equity, including through joint ventures, and policies related thereto
 - c. import dependency (equipment + raw materials + components) related to technology imports
 - d. impact of technology flows on export expansion, export diversification - especially manufactures from modern sectors of industry, and export diversification - by geographical areas.

We may have to use illustrative studies to supplement the statistical information available.

2. Between economic development/industrial development and sectoral diversification with:
 - a. the presence, scope and depth of national technology policies
 - b. the institutional mechanisms available for technology transfer, and the regulatory policies followed.
3. Economic development and industrial growth with:
 - a. indigenous technology development mechanisms and policy
 - b. R+D expenditures
 - c. scientific and industrial manpower
 - d. technology absorption mechanisms and regulations
 - e. expenditure on R+D of firms importing technology.

4. Examine the role of the public sector in:
 - a. volume and value and sectors involved in technology imports
 - b. R+D expenditures
 - c. horizontal transfer of technology

5. Draw the same comparison as at point 4 above, for the private sectors.

TABLE 3

PERIOD:

BY:

NUMBER OF CONTRACTS BY SUPPLIER COUNTRY

OTHERS ^{*}/

TOTAL

NO.

%

TABLE 4

PERIOD:

BY:

NUMBER OF CONTRACTS BY LEVEL OF FOREIGN HOLDINGS

IC	0 %	1 - 25 %	26 - 49 %	50 - 66 %	67 - 99 %	100 %	OTHER * /	TOTAL
AL NO.								
%								

* Companies other than direct participation in capital of national company by foreign company.

TABLE 6

PERIOD:

NUMBER OF CONTRACTS BY PAYMENT TYPE

FIXED ROYALTY	VARIABLE ROYALTY	MINIMUM ROYALTY	FRONTEND PAYMENT	DOWN PAYMENT	REIMBURSEMENT PAYMENT	OTHER	TOTAL

