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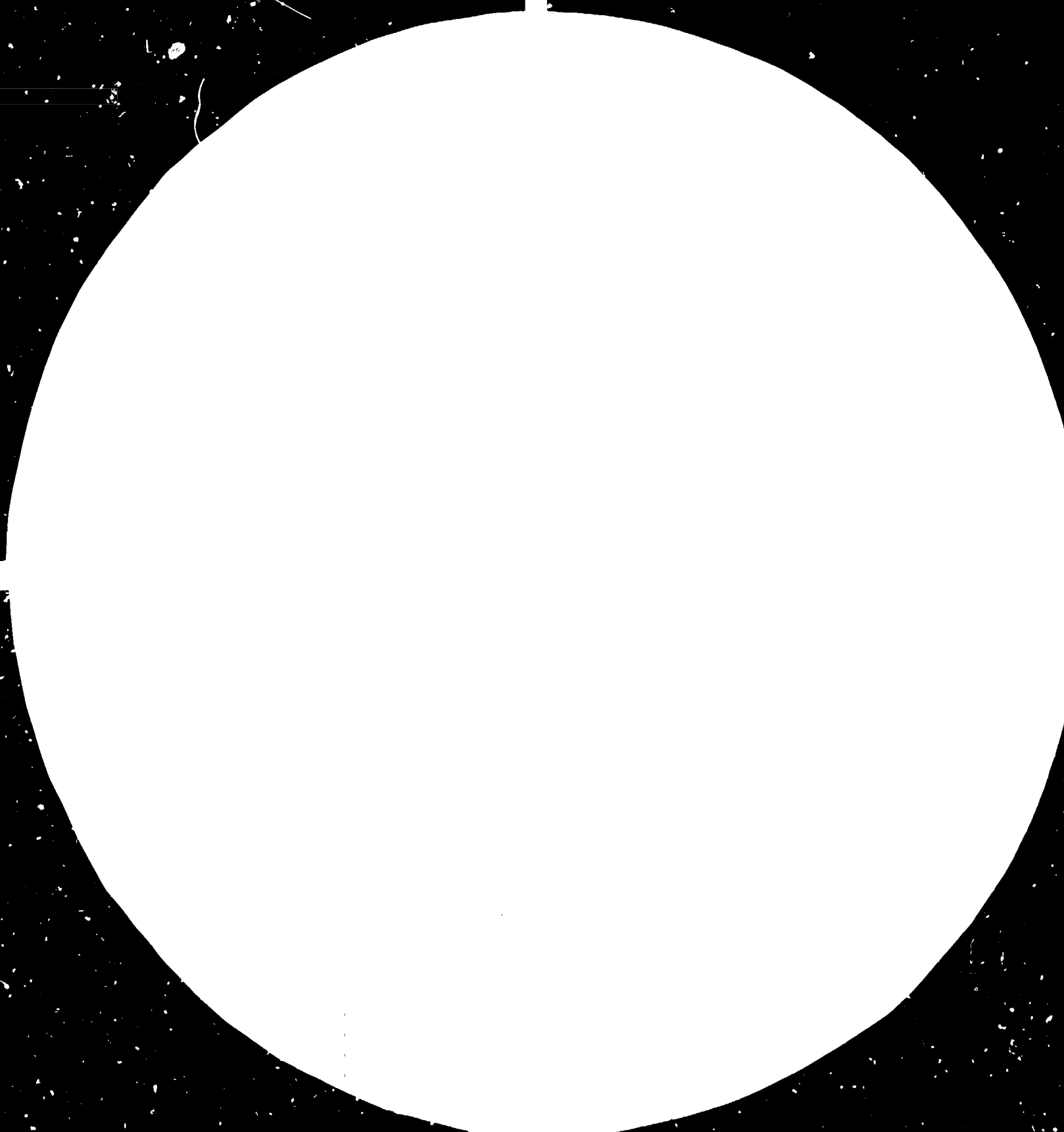

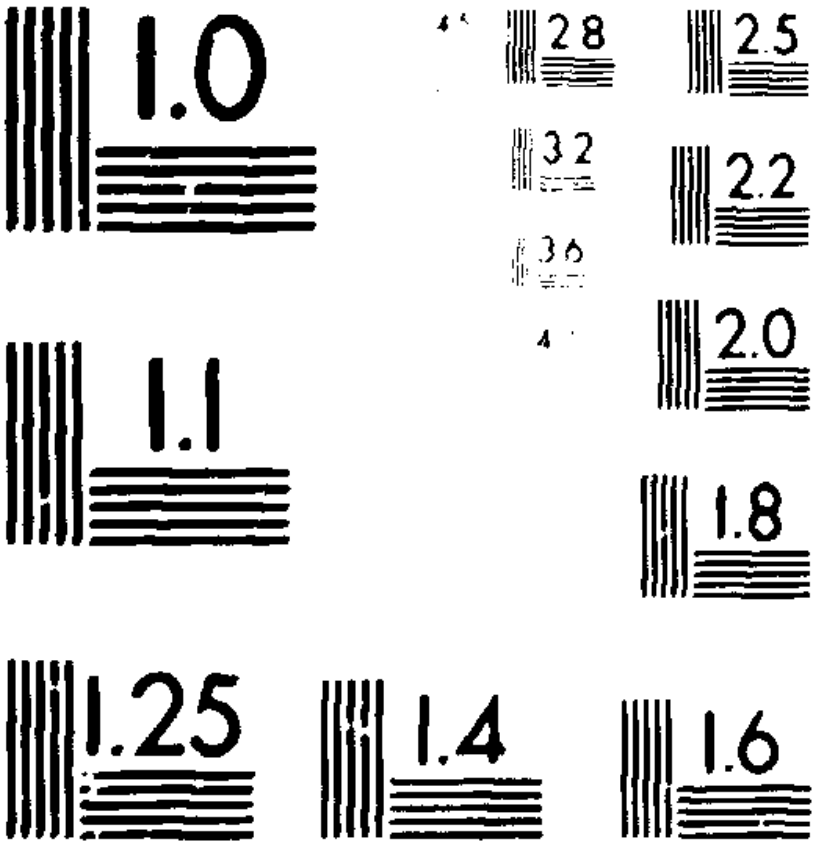

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UNITED NATIONS
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Expert Group Meeting on
Technology Exports from Developing Countries
Vienna, Austria, 19-21 December 1983

Report*

(meeting on technology exports from developing countries)

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Introduction

1. The Expert Group Meeting on Technology Exports from Developing countries was held in Vienna, Austria, from 19-21 December 1983. The purpose of the meeting was:

- to review the experience of some leading developing countries in the field of technology exports and to identify constraints and potentials;
- to identify policy actions to be taken by the governments of developing countries to promote technology exports;
- to discuss and make recommendations concerning informational mechanism for promoting and facilitating international exchange of commercially available technologies developed or adapted in developing countries; and
- to identify the lines of international action and particularly further action by UNIDO in this field.

Conclusions and recommendations

2. The meeting reviewed carefully the UNIDO country studies on export of technology from developing countries and considered these studies a valuable contribution towards a better understanding of the nature, potential and constraints of technology exports from developing countries. It recommended that UNIDO would take into consideration in any country or regional study on technology policy, the element of technology exports as a possible contributing factor in obtaining the development objectives.

3. Since one of the principal constraints for the effective flow of technologies from developing countries is the lack of technological information and its effective diffusion, and recognizing that a number of national, regional and global systems of information were in existance for a variety of purposes, the meeting recommended:

a. an international information mechanism be introduced which would facilitate the exchange of basic data on technologies commercially available in developing countries;

b. such a mechanism should be based to the largest possible extent on the existing national, regional and international information systems;

c. country missions should be undertaken to review and examine their potentials as effective contributers to the international technological information mechanism;

d. a meeting of representatives of national focal points should be convened to evolve the concept and operational framework, and initiate the mechanism itself.

4. Since a framework for national and international action will be based on the proper understanding of the nature, potentials and constraints of the phenomenon of technology exports from developing countries and recognizing that most empirical studies have focussed on the experience of the exporting country, the meeting recommended that further studies be undertaken to increase understanding, particularly in the following areas:

a. bias against technologies from developing countries;
b. the role of transnational corporations;
c. role of national industrial structure and policy environment, in particular those related to technology transfer regulation and technological development;
d. potential benefits for the technology recipient.

5. Recognizing that there is a need for a more effective marketing of technologies from developing countries, the meeting recommended the study of the feasibility for establishing technology trading companies either at a national or international level, as a network of such institutions.

6. Recognizing the importance of the diffusion of technologies from developing countries by the reduction of bias against the emerging suppliers, the meeting recommended that international agreement should be reached on the appropriate joint promotional measures which may include a combination of preferential terms, insurance and financial guarantees.

I. Organization of the meeting

7. The expert group meeting was attended by five participants and three observers from international organizations.

Opening of the meeting

8. The meeting was opened by the Director of the Division for Industrial Studies of UNIDO who stated that the Third General Conference of UNIDO in

its New Delhi Declaration and Plan of Action on the industrialization of developing countries and international co-operation for their industrial development, stressed the necessity for establishing and fostering national capabilities for identifying and encouraging endogenous industrial technologies and to give high priority to programmes of co-operation between developing countries as well as to foster their technological co-operation.

9. At the same time, total technology exports of developing countries, in terms of royalties, know-how fees, engineering and consultancy payments, amounted to approximately $100 to $150 million in 1978, as against total imports by these countries of approximately $2 to $3 billion. The amount of technology payments by developing countries will increase, according to UNIDO's forecast, to $6 billion by the year 1985. Most of these payments represent payment outflows by the third world for imported technology and know-how from industrialized countries.

10. Apart from massive technology payments for imported technology, there is another problem which makes it necessary for more attention to be paid to technological co-operation among developing countries and in particular, to the promotion of technology exports from these countries, and this is the problem of the relevance of the technology to be or being transferred. In this respect, the flow of technologies originating in, or adapted by, developing countries to other developing countries is of prime importance.

Election of officers

11. The following officers were elected:

Chairman: Mr. C.B. Jain (India)

Rapporteur: Mr. J. Monkiewicz (Poland)

Adoption of the agenda

12. The following agenda was adopted:

1. Opening of the meeting
2. Election of chairman
3. Adoption of the agenda
4. Review of the experience in the field of technology exports of some developing countries, their potentials and constraints
5. Governmental policy actions to promote technology export
6. International technological information mechanism and actions to promote and facilitate exchange of commercially available technologies originated in developing countries
7. Actions to be taken by UNIDO
8. Adoption of the report

II. Summary of discussions

Agenda item (4) - Technology exports from developing countries, its nature, potentials and constraints

Nature

13. Technology exports from developing countries are the results of their increasing maturation in the process of development. Empirical studies have shown that in the majority of cases these are based on adapted technologies exported in the form of technological services. There is a certain amount of comparative advantage for developing countries in some markets where their technology may be more appropriate. Some of these markets are characterized by the absence of strong competition from the traditional source of supply. However, in some sectors they are in more direct competition with the rest of the world.

14. Interrelationships between the policies on importation and assimilation of technology and a country's technology export strategy should be clearly understood. Such an understanding would increase technology export capability and would allow measures to be taken at an early stage of the process.

15. Since thechnology exports from developing countries are not independent from the national industrial structure and policy environment, including industrial trade and technological development policy, it would be useful to have a clearer understanding of such interrelationships.

16. Since most studies have concentrated on a limited number of exporting countries, there is a lack of proper understanding of the experience with technologies imported from other developing countries.

Potential

17. Rich experience of adaptation and application of technologies exists in developing countries, in addition to some experience with self-generated technologies, although it is dispersed and not easily accessible. Experience of this nature should be shared, and new technologies made available to other countries, thus reducing time and expenditure involved in creating what has already been done.

18. The potential for technology exports is directly related to the benefits accruing to both the exporting and importing countries and enterprises. Such benefits may include:

(1) More appropriate technology in terms of decreased costs, social values or the best use of local raw materials;

(2) Broadening the sources of technology which may improve the bargaining position of the buyer:

(3) Positive feedback for the sellers which may further their technological development;

(4) Increased self-confidence among developing countries with respect to their own technological capabilities.

19. A better assessment of the potential benefits required a better understanding of the nature of the different modes of transaction since their costs and benefits to the sellers and buyers in the long and short run are different.

Constraints

20. One of the principal constraints is the lack of appropriate information relating to both the potential importer and exporter of technology. The buyer will not have information about alternatives and the seller may not be aware of the potential demand of his technology outside his country. A related aspect is how to obtain an effective diffusion of information as merely the availability of information is insufficient.

21. The second constraint is the lack of adequate assessment capability on the importer's side in order to be able to adequately judge the potential benefits of technology.

22. The financial system is a powerful element influencing the source of technology and related inputs. The financial weakness of developing countries puts them at a disadvantage vis-à-vis the developed world in promoting the exports of their own technologies and inputs. This relates both to technology suppliers and buyers.

23. A related constraint is the bias that frequently exists against technologies where there is little experience available in order to judge their effectiveness in practice. This bias is rational in so far as it derives from an aversion to risk, but it nonetheless hinders appropriate diffusion and may be counteracted by insurance or other mechanisms.

24. Exports of technology require certain specific skills and knowledge from the exporting organizations and countries. Lack of proper experience and trained people may be an important element hampering export activity.

25. The phenomenon of market dominance by, in some instance, traditional suppliers of technology, tends to inhibit the development of indigenous technology to its full measure and is the consequential constraint on technology exports. It also restricts broadening the choice of technology import from alternative supply sources from developing countries.

Agenda item (5) - Policy actions to promote technology exports

National

26. There is an obvious need for promoting technology export activity both at the national policy makers' level as well as the international level.

27. The export of technology should be seen as one of the products of a local technological advance and a contributing factor which enables greater economics of scale, specialization and learning. Promotion of technology exports must therefore be seen in the context where the objective is the building up of an appropriate local technological development. A major practical problem is the attainment of a proper balance in the degree of protection which is provided at the national level. Such a balance however can only be achieved by iterative actions.

28. To procure a stronger foothold in the international technology market, developing country exporters have to receive much more assistance from their respective governments. The degree of promotion offered should be viewed from the point of view of the targets that can be achieved at the national level. This requires a proper understanding of the nature of the transactions involved. It may be advisable that technology export incentives be given at least as much attention and priority as incentives for commodity export transactions and technological activities related to the local market.

29. In the short run, as a greater understanding is acquired on the nature, potential, benefits and constraints an area for immediate action is the development of an effective information system which will facilitate technology flows among developing countries on the technologies available from developing countries.

30. In order to create a sound basis for government action in the aforementioned area, it may be necessary to begin with the establishment of reliable statistics of the technology export contracts concluded and subsequently a system for their monitoring integrated in the system for the promotion for the local technological capability.

31. Greater association with consulting and design engineering firms by local developers of technology could help in promoting technology exports through the transformation of available technologies into technologies already in use commercially.

32. In order to promote technology exports from developing countries, and based on the proper understanding and awareness of its potential, training programmes should be developed or existing ones ammended to reduce barriers and uncertainties of potential exporters and importers and thereby increase the managerial capability to handle such transactions.

33. In order to promote technology exports, appropriate measures should be taken at the national level in developing countries to provide local entrepreneurs and enterprises with the possibility to compete with traditional sources of technology in foreign markets through appropriate credit and tax policies.

34. National policy action to promote the export of technology must be linked to an integrated national technology policy, and as such, national technology transfer laws should be adapted for this purpose.

International action

35. Apart from the creation and better utilization of the existing information system, efforts such as solidarity meetings for LDC's, Investment Promotion Meetings and plant level co-operation programmes should be better utilized as a contributing factor to the bridging of the information gap.

36. Development of case studies to analyze successes and failures of intra-developing country technology transactions, in particular from the point of view of the acquiring party, would contribute to a better understanding of its nature.

37. To increase the appropriate diffusion of technologies from developing countries by the reduction of bias against the emerging suppliers, international agreement should be reached on the appropriate joint promotional measures which may include a combination of preferential terms, insurance and financial guarantees.

38. To reduce the financial constraints, the existing financial infrastructure at the international level should be adapted to enhance the technology transfer flows among developing countries.

39. In order to increase the promotional and organizational capability of developing countries to export technology, existing experience should be shared and resources drawn together to accelerate the further development of such efforts. This sharing can take the form of joint marketing efforts (e.g. technology marketing agency), joint bidding efforts in predetermined priority sectors for technological development and joint trainging efforts, including the preparation of guidelines.

Agenda item (6) - Technological information exchange mechanism

40. The meeting discussed the issue of technological information exchange as an important supportive measure for promoting and accelerating flow of technologies among developing countries as well as to industrialized countries. The nature of the information and some end-users of the information were broadly identified. Possible institutions in developing countries who could act as national focal points for gathering technology and related information in their countries and constitute a part of UNIDO system, were discussed. Such focal points are also expected to disseminate information on technology and associated services in their own country to potential users and enterprises.

41. Different types and degrees of information would be needed by various groups of users. Among the groups of users identified by the meeting are the following:

i) Industrial associations of enterprises and entrepreneurs,
ii) Manufacturing sectors,
iii) Chambers of commerce and industries of entrepreneurs (associations),
iv) Professional engineers' and managers' associations,
v) Research and development institutions,
vi) Government departments concerned with industrial and technological development and export of technologies, engineering services, capital goods and turn-key projects,
vii) Development banks and industrial financial institutions,
viii) Academia,
ix) Media.

42. It was recognized that all elements of information cannot be available to the various groups at a given point of time due to resource constraints. In this context, the importance of providing technological information to industrial enterprises was stressed.

43. The Group recognized that a number of national, regional and global systems of information were in existence for a variety of purposes. It was suggested that the proposed information system of UNIDO for promoting and facilitating technological flows should take into account such existing systems and their orientation. Such a system should also be looked upon as an additional and powerful source of technological information for INTIB services.

44. Arising out of the discussion, concensus was reached that the information system on technology flows among and from developing countries to developed ones, is of critical importance to increasing technology exports from developing countries. In the light of this, the following recommendations emerged for future course of action.

At the country level:

- Nominate a national institution to serve as a focal point for UNIDO's technological information system. The national focal point may establish further linkage with other institutions within the country specialised in different technological spheres;
- Strengthen existing national information mechanisms for gathering and disseminating information on commercially available technologies for export as well as for the domestic market. Special attention will have to be paid to increasing such exports among developing countries.

At the UNIDO level:

- To identify national focal points in selected developing countries through consultations with these countries and examine their potential as effective contributors to the UNIDO information system;

- To establish working relationships with national focal points in order to facilitate an effective and efficient flow of technological information to and out of these countries, particularly among developing countries;
- To survey the existing regional and global information networks to identify the manner in which linkages can be established as far as technological information contacts are concerned;
- To organize a meeting of representatives of national focal points to evolve the concept and operational framework for UNIDO's technological information mechanism within the overall framework of INTIB.

Annex I

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Annex II

List of Documents

CRP. 1	Technology Exports from Developing Countries: issue paper
CRP. 2	International exchange of commercially available technologies, originated from developing countries - nformational aspects, Note by the UNIDO Secretariat
CRP. 3	Technology Exports from Developing Countries, C.B. Jain
CRP. 4	An approach to evaluation of Yugoslav Technology Exports, Dusan Strujic
CRP. 5	Technology Exports from Korea, Y.H. Kim
CRP. 6	Intra-developing countries technology flows: Some aspects and issues, Kan D. Mariwalla
CRP. 7	Technology Exports from Developing Countries, Dimension, Significance, Implications and Issues. Summary Report of five country studies (preliminary version)
ID/203	Technologies from developing countries (I)
ID/246	Technologies from developing countries (II)
ID/289	Technology exports from developing countries (I) Argentina and Portugal
UNIDO/IS.353	Technology exports from developing countries, the case of Yugoslavia
UNIDO/IS.362	Technology exports from developing countries, the case of Egypt