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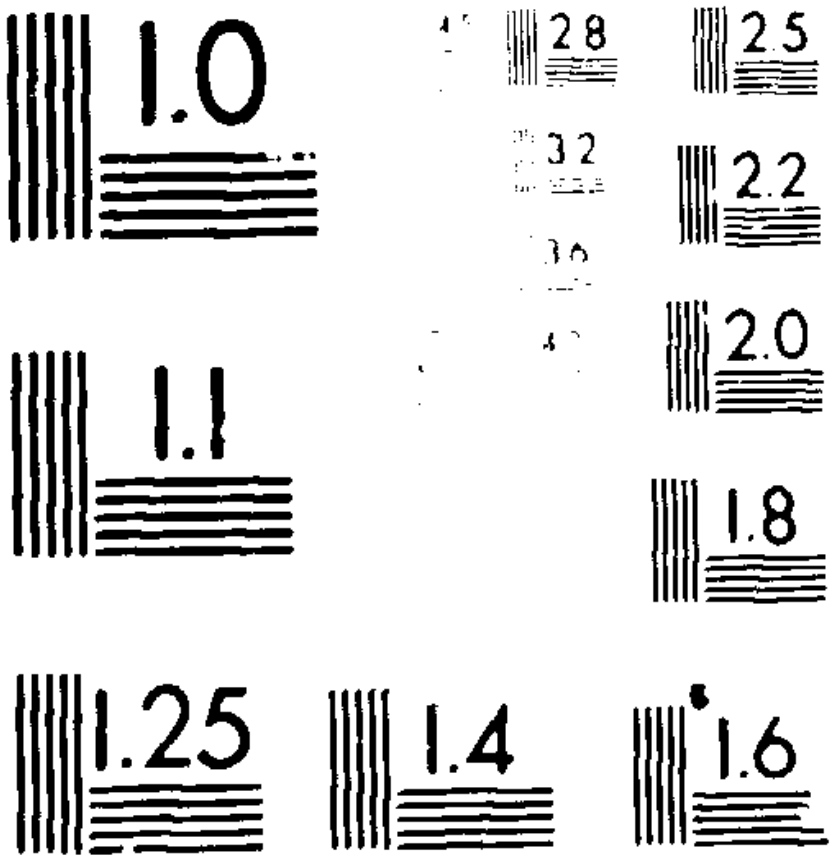

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TIES NEWSLETTER

TECHNOLOGICAL INFORMATION EXCHANGE SYSTEM

Issue No. 33 13468 March 1986

Dear Reader,

This issue of the TIES Newsletter, the second in this calendar year, will give you an insight to two further facets of the transfer of technology, i.e. the programme on plant-level co-operation for the transfer of technology and the transfer of technology flows. Also to be found in these pages is a review of the workshop on Technological Services Delivery System (TSDS) which was held at UNIDO Headquarters in Vienna from 10 to 13 December 1985. Further articles cover a country profile on Ecuador, an explanation of the structure of CONITE (Comision Nacional de Inversiones y Tecnologias Extranjeras) at Lima, Peru, as well as a further chapter on the Guide on Guarantee and Warranty Provisions in Transfer of Technology Transactions, this time on the very important subject of training.

Issue No. 32 of the Newsletter presented an item on UNIDO's Technology Advisory Services on the negotiation of technology transfer contracts, and in this issue I should like to give you an explanatory note on what this service is and how it works. This service could be of great value in solving some of the problems faced by developing countries in technology transfer and it is hoped that more countries will be encouraged to make use of TAS once they become aware of it.

I am very pleased to be able to inform you that the Polish Government has very kindly offered to host this year's meeting of Heads of Technology Registries to be held at Warsaw sometime in October. The focus of this year's meeting will be on information, its gathering, storing and exchange through C RIS (the software package prepared by UNIDO). Preparations for the meeting are well under way and details will be circulated shortly.

On a final note I should like to inform you that a colleague, and to many of you a friend, has decided to leave the United Nations for industry. Mr. J. Cramwinckel came to TIES, and UNIDO, directly from Venezuela where he served as a Junior Professional Officer and now after five years in Vienna, has decided to return home to his native Holland to join the ranks of Shell-BP. We wish him and his charming family all the best of success in their new enterprise.

K. Venkataraman
Special Technical Adviser
UNIDO Technology Programme

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CONTENTS

Country profile - Ecuador

1. Legislation

(A) Foreign investments

(1) Laws and regulations in force

Supreme Decree No. 974, Registro Oficial No. 264

Decisions 24, 37, 37A, 47, 48, 103, 109, 110, 125, 144

Supreme Decree No. 187, 689, 900-A, 1150, 2605-B, 1608

(2) Registration

The Central Bank of Ecuador will register foreign investments authorized by the Ministry of Industry, Commerce and Integration.

(3) Scope

All direct foreign investment in private (not governmental) Ecuadorean firms.

(B) Industrial property

(1) Laws and regulations in force

Decreto No. 1257, Registro Oficial No. 304 'Decision 85'

(2) Scope 1/

Patents, trademarks, commercial names, designs

(C) Technology transfer

(1) Laws and regulations in force

Resolución 383, Registro Oficial No. 885

(2) Regulation

(3) Scope 2/

Transfer of technology contracts between Ecuadorean citizens (not governmental firms, private firms only) and foreign firms including:

(i) License contracts covering patents;

(ii) License contracts covering trademarks;

(iii) Service contracts for administration and operation;

(iv) Technical assistance contracts including supply of technical knowledge, training, engineering services, etc.;

(v) Contracts that imply technology transfer.

(4) Restrictive practices 3/

(i) Obligations to acquire from a certain source capital goods, intermediate products, raw materials or other technologies, or to permanently use personnel designated by the supplier company;

(ii) Clauses which give the supplier the right to fix sale or resale prices of the products produced from the technology;

(iii) Clauses which restrict volume or structure of production;

(iv) Clauses which give the supplier total or partial rights of purchase;

(v) Clauses that require the recipient to transfer inventions or improvements obtained by using the technology to the supplier;

(vi) Clauses that require royalty payments to patent or trademark holders for patents or trademarks not used;

(vii) Other clauses with equivalent effect;

(viii) Prohibition or limitation on export or sale to specific countries.

(5) Remuneration 4/

All payments to supplier must be made in Sucres. The supplier is free to convert Sucres to foreign currency at the free market rate, there is no limit to the amount of Sucres that may be converted.

(6) Taxation 5/

The recipient is responsible for all Ecuadorean taxes except remission of royalties which is borne by the licensor (approx. 44 per cent).

Institutional arrangements

(A) Competent approval authority

Mr. José Villacis Paz y Miño
Director
Ministry or Industry, Trade and Integration, Foreign Investment and Technology Department
P. O. Box 194-A
Quito, Ecuador
Tel: 523-343
Tlx: 2166 MICEI

(B) Office staffing

Management -	Director	1
Evaluation -	Engineers	2
	Lawyers	2
	Economists	2

1/ Indication for which sectors trademark and patent registration are allowed.

2/ Reflects the scope of the registration with regard to type of agreement and sectors (ISIC).

3/ Clauses which are not permitted to appear in contracts by law or regulation.

4/ Technology payment restrictions by law or regulations.

5/ Taxation policies on technology transfer payments.

Study/evaluation

(C) Competence

Approval of technology transfer contracts between Ecuadorean citizens and foreign firms.

(D) Co-ordination

- Central Bank of Ecuador
- Propriedad Industrial del Banco Central
- INEN (Instituto Nacional de Normalización)
- Centro de Desarollo Industrial del Ecuador (CENDES)
- Consejo Nacional de Ciencia y Tecnologia (CONACYT)

(E) Evaluation 1/

- Cost of technology as related to final sales price of products produced from the technology;
- Use of national labour and raw material resources;
- Effect on the financial state of recipient especially as regards profits to be generated by products made or services rendered as a result of the technology;
- Exclusivity of rights regarding the contracted technology.

Comision Nacional de Inversiones y Tecnologias Extranjeras (CONITE), Lima, Peru

The following is information on the structure and work of CONITE, a long-time member of TIES.

1. Legal basis

The structure and functions of CONITE were established by Supreme Decree No. 005-82-EFC of 8 January 1982 in accordance with the provisions of supplementary item four of Legislative Decree No. 71.

This set out the functions of the Technology Directorate, as follows:

(a) To fulfil and ensure fulfilment of the instructions of the General Secretariat;

(b) To identify, compile and organise information regarding technology available on the world market in order to determine the most favourable and appropriate alternatives for local companies;

(c) To provide analysis and information about:

(i) The approval, extension and amendment of contracts covering the transfer of technology, patents and trade marks of foreign origin; and

(ii) The approval, extension and amendment of contracts covering the export of technology, patents and trade marks of Peruvian origin;

(d) To check on payments arising from contracts covering the transfer of technology, patents, trade marks and other items of industrial property of foreign origin, as well as proceeds from the export of Peruvian technology, patents and trade marks;

(e) To co-ordinate (by delegation) its efforts with technological institutes and agencies in the public sector in matters relating to the transfer of technology, trade marks, patents and other items of industrial property;

(f) To carry out other functions allocated to it by the General Secretariat.

The decision of the board of CONITE (No. 005-81-EFC/35 of 23 October 1981) set out the conditions governing the approval of contracts covering the transfer of technology, patents and trade marks of foreign origin, along with general criteria for assessing the relevant contracts and standards for checking on the payment of royalties for the use of foreign technology.

Furthermore, in annex I (see page 16) to this decision companies were asked for specific and detailed information about the technology in question and economic data on the companies' activities in order to have the necessary parameters to analyse the effects of the technology covered by contract.

2. Contracts approved

CONITE ruled on 466 contracts covering the transfer of technology, patents and trade marks of foreign origin in the period 1981-84, as shown below:

Contracts approved

Year	Number
1981	136
1982	132
1983	92
1984	106

CONITE approved both new contracts and extensions, particularly the latter. In 1984, of 106 contracts, 54 per cent were extensions (57) and 46 per cent new contracts (49).

Contracts approved - broken down by sector of the economy

If the inflow of foreign technology is examined sector by sector, the largest percentage of contracts in the period 1981-84 was found in the industrial sector, mainly pharmaceuticals (CIIU: 3522), which accounted for 28 per cent (129). These contracts mainly concerned technology items: trade mark licensing and know-how.

Contracts approved - broken down by country of origin

As regards the country of origin of the companies transferring technology, the largest number of contracts, i.e. 46 per cent (213), is with companies in the United States of America, 12 per cent (54) Federal Republic of Germany, 8 per cent (39) Switzerland, 6 per cent (28) France and 4.5 per cent (21) United Kingdom. As shown in annex 2 (see page 18) the remaining countries only account for a small proportion.

1/ Major evaluation criteria should include internal guidelines for royalty rates (and definition), forms of payment preferred, restrictive practises other than those covered by the Law Regulations, etc.

This indicates that five countries alone accounted for 76 per cent of the contracts approved in the period 1981-84: United States of America, Federal Republic of Germany, Switzerland, France and the United Kingdom.

The contracts covered a variety of technology components, ranging from items of industrial property (licence to use trade marks, patents, etc.) to unpatented technological knowledge (technical information, know-how, technical assistance, etc.).

Most contracts were approved for a lifetime of not more than five (5) years, with provision for subsequent extension.

The most frequent type of royalty payment is that based on a percentage of net sales. Payment of a fixed sum is rare, although this arrangement has been approved in some new contracts. Furthermore, approval has been granted for some contracts which embody no royalty payment. These generally relate to the bottling of non-alcoholic drinks (CIIU: 3134) and represent an average of 8 per cent in the period 1981-84.

3. Payment of royalties

The total paid during the period under assessment (1981-84) was equivalent to US$21,172,412.76, as set out below:

Royalties paid

Year	Amount (US$)
1981	4,024,880.95
1982	7,863,661.12
1983	4,252,711.31
1984	5,031,151.38
TOTAL	21,172,412.76

The year in which the largest amount of royalties was paid was 1982 with a total of US$7,863,661.12 - a figure that has not been exceeded since. The amount has decreased in recent years because fewer companies have paid royalties due to the critical economic and financial conditions brought about by the economic crisis. (See annex 3, page 19)

3.1 Payment of royalties - broken down by sector of the economy

Examination of royalty payments abroad according to economic sector shows that the largest amount related to Group 352 (manufacture of paints, pharmaceutical products, cosmetics and others), i.e. US$6,658,083 or 31.4 per cent of the total.

The next largest amount was for CIIU Groups 3112 (manufacture of dairy products) and 3115 (manufacture of vegetable and animal oils and fats), which together made up US$2,048,430.9 or 10 per cent of the total paid abroad during the period.

3.2 Payment of royalties - broken down by recipient country

The most royalties were paid to the United States of America (43 per cent), the Federal Republic of Germany (19 per cent), Switzerland (10 per cent), the United Kingdom (7 per cent) and France (4 per cent). As can be seen from the annex, the other countries only account for a small proportion.

It follows from the foregoing that five countries alone received US$17,628,550 or 83 per cent of the total paid in the period 1981-84.

4. Additional activities in the period 1981-84

4.1 Participation in SAIT

- During this period the Technology Directorate also participated actively in the Andean Technological Information System (SAIT), a permanent form of subregional co-operation for joint action and organized contacts between Member Countries in matters relating to technological information, set up in pursuance of Decision 154 of the Commission of the Cartagena Agreement, which establishes the relevant targets, structure and competent organs.

- In view of the targets set in SAIT, there has been an exchange of technological information regarding contracts covering the transfer of technology, patents and trade marks.

- In order to achieve this target within the Andean Group, the staff of the Technology Directorate has done additional work filling in the information forms designed for this purpose by SAIT.

- This exchange of information with the other Andean Group countries has enabled us to apply more criteria when assessing technology contracts and to strengthen our technology negotiation capability.

- Moreover, through SAIT, thanks to the grant of secondments by the Board of the Cartagena Agreement, three officials of the Technology Directorate were able to visit the offices of the competent national agencies in Colombia and Venezuela and to become acquainted with these agencies' experience and criteria with regard to contracts covering the transfer of technology, patents and trade marks.

- In addition, it is important to mention the First Andean Information Seminar on Technology Transfer, held from 5 to 9 September 1982 at Lima, attended by the entire staff of the Technology Directorate.

- There are meetings of the SAIT Steering Committee each year to evaluate the results achieved and to make a conjunctural analysis of the System with reference to the targets fixed for the period concerned. The Fourth Meeting of the Co-ordinating Committees of the Specialized Foreign Investment and Technology Transfer Information Networks of SAIT was held between 11 and 13 February 1985 at Lima. CONITE was entrusted with the organization of this event.

  The targets fixed at this meeting for this year include a first seminar at Mexico City which will be attended by an official from CONITE. There will also be staff secondments outside the Subregion and secondments in the subregion will continue for officials who have not benefited from this previously.

As in the past, all this will help to enhance the effectiveness of the CONITE's staff.

4.2 Participation in TIES (UNIDO's Technology Information Exchange System)

- The participation of the Technology Directorate in this System as an active member stems from its attendance at the Meeting of Heads of Technology Transfer Registries, held in India in 1983 and China in 1984.

  These meetings have led Peru to take an active part in the System, which periodically sends us various types of information with reference to technology transfer. The Andean Group is also playing an active part in TIES and a special form has been designed for the exchange of technological information between SAIT and TIES to be used for exchanging information regarding contracts approved in 1984.

- As an active member of this System, this will benefit CONITE since it will bring awareness of the problems faced and actions taken by other countries, thus extending the criteria at CONITE's disposal for improved contract appraisal.

  Furthermore, there is a project within TIES to use a computer to sort and arrange existing technological information in the member countries.

4.3 Training abroad

The Getulio Vargas Foundation in Brazil, supported by the IDB, began in 1982 to run a course for those involved in technology transfer negotiation. To date, three officials from CONITE have attended this course (in 1982, 1983 and 1984).

In Spain, the World Industrial Property Organization arranges periodic courses on industrial property, which have so far been attended by two officials (in 1981 and 1982).

5. Problems in achieving specific goals and targets

The most significant problems encountered during the period in question include the failure to implement research projects and the frustration felt by trained personnel, principally because of the lack of support staff, making it necessary to collaborate mainly with people on whom we could not rely to pursue our work.

The lack of specialized technical staff made it impossible to conduct an exhaustive evaluation of the technical aspects or the effects on technological progress with particular regard to the production process, the degree of domination by the concessionaire and the use of local services and resources, among others.

TECHNOLOGY ACQUISITION AND TECHNOLOGY ADVISORY SERVICES

Technological Services Delivery System (TSDS)

The Workshop on Technological Services Delivery System (TSDS) was held from 10 to 13 December 1985 at the UNIDO Headquarters in Vienna, Austria, and was attended by nine participants from six countries including the donor country, as well as a representative from the UN Centre for Science and Technology for Development.

The Workshop had the following objectives:

(a) To exchange views on the experience obtained through project activities in the Philippines (TSDS) and in the Caribbean (CTCS), as well as other technology delivery systems;

(b) To discuss whether any improvements can be made in linking small- and medium-sized industries, particularly in rural and remote areas, with existing R+D and related services provided by existing institutions;

(c) To develop a model prototype project framework and guidelines that could serve as a basis for applying the concept to other countries and/or regions;

(d) To recommend ways and means of promoting the project concept.

The need to strengthen technological capabilities is being increasingly recognized as the fundamental precondition for a sound and fruitful industrial and economic development in developing countries. During the past years much work in international development co-operation has been undertaken in this respect on basic levels by the governments themselves. The number of institutions and organizations established, and the multifaceted spectrum of training programmes organized by or for the developing countries are good indications of these efforts. The increased flow of information, another important aspect, has also been tackled quite intensively, resulting in the creation of a number of information centres and information services in the developing countries.

However, when analysing and assessing these efforts and more important their anticipated impact on the economic and industrial development of the country, there seems still much more to be desired. Specificallly, there appears to be a lack of (some) interlinkage and interaction between and among those measures in the fields of human resources, institution building and information services, that could bring about positive benefits to the maximum extent possible in responding to the needs, especially of the small and medium industries (SMIs) sectors.

The integration of the various institutions and organizations into a viable "Institutional Infrastructure" is often missing. An object-oriented programme of manpower building to meet the medium- and long-term needs of the industrial development orientation in general, and of the priority industrial sectors in particular, is lacking. Information systems may have been established but not trimmed to focus sharply on the priority development objectives and policy orientation of the country.

With the financial support of the Government of Japan, UNIDO had undertaken a pilot project "Strengthening and Modernisation of the Technological Performances of Small and Medium Industries in Selected Countries of the ESCAP Region". The basic concept of this pilot project was to seek ways and means of mobilising locally existing technological capabilities, in a co-ordinated manner, by providing required services and thus strengthening and modernising the technological performances of the small and medium industries (SMIs).

The TSDS concept foresees the setting-up of a supportive network-mechanism interlinking technological capabilities available in indigenous technological resource institutions (TRIs) with the SMIs, and thus promote the self-reliance of developing countries at the national level. In outline, it involves designating a central co-ordinating unit (CCU) and a number of regional advisory centres (RACs) which would provide various services to the SMIs in the respective regions, and form a linkage between the SMIs and the TRIs. The regional advisors attached to the RACs, with the support and co-operation of the appropriate TRIs, would assist the SMI entrepreneurs in identifying plant-level problems, diagnose operational weaknesses, provide managerial, financial, marketing and technical counselling, and pinpoint areas of possible improvement. Problems beyond the scope of the RACs and/or the TRIs would be referred through the CCU to appropriate external sources such as UNIDO, whose assistance would be carried out together with the relevant TRIs and the RAC officials, to ensure that the expertise remains within the country in the form of accumulated experiences at the TRIs.

Through such grass-root level activities, the TRIs would be able to come face-to-face with problems of the SMIs, hence formulate more realistic and useful work programmes, including priority subjects and areas of R+D needs and thus best serve the SMIs and the overall industrial development of the country.

Activities related to the implementation of the pilot project at a national level in the Philippines and its extended application at a subregional level in the Caribbean, seems to have demonstrated the viability of the concept. However, it has been made clear that the two cases were specific examples of tailored approaches, available in its form only for the respective country or subregion.

As a follow-up to the Vienna Programme of Action on Science and Technology for Development and its Operational Plan, the UN Advisory Committee on Science and Technology for Development (UN-ACSTD) organized a Panel Meeting on "Reinforcement of Linkages between Research and Development Activities at the National and International Levels as well as within the UN System" in Lima, Peru. The experiences of the TSDS in the Philippines and the Caribbean subregion were presented and discussed in connection with user-oriented technology delivery mechanism. The Panel considered TSDS to be an effective approach, and strongly recommended for promotion in the form of pioneer projects.

Furthermore, there were other forms of delivery systems being implemented in other countries with similar basic concepts for maximum utilization of local expertise, and the experiences of these programmes would definitely contribute to the improvement of the TSDS concept.

Summary of discussions

After presentation of the Philippine and Caribbean experiences and discussions thereof it was agreed that TSDS is a very useful concept and in the case of the Philippines has given rise to many new projects.

From the presentations of participants from Malaysia, Greece and Thailand, it was apparent that conscious efforts were being made to create linkages between the scientific and technological institutions and the SMI which to some extent coincides with the TSDS concept. It was agreed that most developing countries still have a long way to go in enhancing the linkages between the TRIs and SMIs in order to fully utilize their existing scientific and technological capabilities in strengthening and developing their SMIs.

With increasing emphasis in most developing countries on the SMI sector there has been a proliferation of governmental and non-governmental organizations and of diverse programmes to promote and support SMI development especially in rural areas. The TSDS concept may prove to be a systematic approach to co-ordinate and focus these efforts.

The importance of disseminating the Philippine and Caribbean experiences was emphasized. In particular the CDB representative underscored the value of the Philippine experience in the design and implementation of CTCS. Similarly, the Philippine participants were equally convinced that, had they been exposed to an exemplary experience, their initial efforts in setting up the TSDS would have been much easier.

The participants were in full agreement that due to vast variations between countries in terms of the development of their institutional infrastructure, level of economic development, population size and dispersion, policies and priorities, political structure, etc. no universally applicable TSDS model could be devised. It was felt that aside from relating particular national and regional experiences, an attempt could be made in devising guidelines which could be helpful for each country in developing their own TSDS tailored to their circumstances and existing situation.

It was felt that the first step in initiating a TSDS, a pilot project of a limited scope, could be launched to a small number of selected priority sub-sectors and regions. The objective of such a pilot project would be to establish initial linkage mechanisms between the TRIs which are related to those subsectors by means of developing specific technical assistance activities to selected SMI groups.

The pilot project should be designed in such a way that its planned activities would lead to a small network of institutions becoming the seeds for an expanding TSDS. From the experiences of the pilot operations, the network activities could gradually be expanded to cover other subsectors and other regions. Furthermore, the experience gained in implementing the pilot TSDS may serve as a basis for the TRIs to redirect their R+D and human resources development programmes in a way so as to be more responsive to the immediate and developmental needs of the SMIs.

In designing a pilot project and secure resources to initiate a TSDS, the following activities may be considered:

(a) An assessment of the needs of SMIs for technical assistance. This study would focus on the technical problems encountered by SMIs and try to identify common needs. Opportunities for medium- and long-term perspectives of the SMIs would also be assessed.

(b) An assessment of the capabilities of the TRIs.

(c) A definition of the technical assistance required by the SMIs. By taking into account the needs of the SMIs this would involve a comparison of the SMI needs and TRI capabilities.

(d) The development of strategies to enhance the effectiveness of implementing projects within the framework of TSDS. This could involve any of the following:

(i) Devising means to enhance the awareness of SMIs on technological options and opportunities to stimulate requests for technical assistance (e.g. newsletters, workshop seminars);

(ii) Devising means for an efficient interaction between entrepreneurs and representatives of institutions involved in the TSDS especially the field extension offices which would serve as a linkage between the SMIs and the TRIs (e.g. plant visits, questionnaires, etc.);

(iii) The implementation of projects addressed to groups of SMIs with common needs. Examples could be training programmes, promotion of common service facilities, etc.;

(iv) Devising cost sharing schemes between the SMIs and the government institutions in the implementation of technical assistance projects;

(v) To make use of government incentives where they exist;

(vi) Other strategies.

(e) The selection of various modes for the delivery of technical assistance. Examples of these are as follows:

(i) Technical information dissemination;

(ii) Technical seminars or other types of training programmes for SMI entrepreneurs, supervisors, workers, etc.;

(iii) Technical advisory services;

(iv) Extension services.

(f) The design of the delivery mechanism. This will involve the following:

(i) The definition of functions of field offices and the central co-ordinating unit as well as the delineation of TRI responsibilities;

(ii) Assessment of capabilities of field offices and co-ordinating units, etc.;

(iii) The identification of action-oriented linkage mechanisms required.

(g) Training of personnel of participating agencies. Training programmes must be designed taking into full consideration the functions and responsibilities of other agencies involved in the implementation of the TSDS. For example, personnel of field offices may need a certain level of technical training to upgrade capabilities in project identification, problem referral, organization of training programmes and in other functions required of them for ensuring smooth linkages between SMIs and TRIs. TRI personnel may need upgrading of their capabilities to better perform the various services related to the TSDS.

(h) For assessing the effectiveness of the TSDS as well as the strategies adopted, technical assistance activities should be implemented on a trial basis.

(i) Monitoring and evaluation should be carried out on a continuous basis.

(j) Formulation of the TSDS work plan. This should clearly specify the responsibilities of each agency as well as the funding mechanisms for the implementation of technical assistance projects in the immediate future.

Budget

The inputs required will be covered by a budget for the implementation of the pilot project. Cost components might be broken down into local currency components and foreign currency components. The latter, as in the case of foreign experts, may be submitted for the consideration by foreign assistance organizations. Portions of local currency requirements may likewise be submitted for financing.

After the initiation process (pilot project) the experience gained is expected to be useful in developing an integrated approach for SMI development. This would include the establishment of linkages between the TSDS and financing, marketing and other service institutions to complement the technical inputs of the TRIs.

Proposed framework for setting up a TSDS

A. Project formulation

1. Programme concept:

(a) Background and justification

(b) Objectives

- Development objectives
- Immediate objectives

2. Participating organizations:

(a) Co-ordinating agency
(b) Field offices
(c) Technology resource institutions

3. Programme design:

(a) Inputs
(b) Activities
(c) Outputs

B. Activities

1. Assessment of needs of SMIs:

(a) Problems encountered

(b) Opportunities for improvement

2. Assessment of capabilities of TRIs

3. Definition of TS required/strategies:

   (a) Comparison of needs and capabilities, and identification of TS required

   (b) Strategies:

   - Creation of awareness
   - Working through associations or groups of SMIs
   - Promotion of common service facilities
   - Attractive cost-sharing schemes
   - Government incentives
   - Other strategies

4. Modes of delivery:

   (a) Information dissemination
   (b) Training
   (c) Advisory service
   (d) Others

5. Design of delivery mechanisms:

   (a) Definition of functions of field offices and co-ordinating agency etc.
   (b) Assessment of capabilities of field offices and co-ordinating agency etc.
   (c) Identification of linkage mechanism required

6. Training of personnel of participating agencies

7. Implementation of pilot project of the delivery system

8. Monitoring/evaluation of pilot project

9. Formulation of TSDS and time schedule

C. Budget

Conclusions and recommendations

Through the discussions and exchange of views, the Workshop reached the following conclusions and recommendations:

(a) The SMIs play an important role in fostering development of developing countries. There is a direct linkage between the development of SMIs and the overall development process of the countries.

(b) Accordingly, it is recommended that the provision of technological services to respond to and satisfy the needs of SMIs should be given high priority in the national economic and industrial development programmes.

(c) In most cases, a fairly high level of technological capability does exist in the developing countries, which should serve as a starting point for strengthening the needs of SMIs.

(d) The Workshop recommends that such existing capabilities be identified and assessed in order that they may be mobilised in a systematic manner to serve the SMIs, particularly in rural areas.

(e) As a pragmatic approach to link the locally available technological capabilities to serve the needs of SMIs, the Workshop felt that TSDS was a viable concept.

(f) However, it was recommended that the TSDS should be tailored to suit the particular conditions, level of development, existing capabilities and priority sectors of the industrial development policies in each country, subregion or region.

(g) The Workshop has proposed a framework for setting up a TSDS. It is recommended that the framework be used as a guideline for formulating similar systems in other developing countries.

(h) In building up the TSDS, it was recommended that other programme activities - such as human resource development, institution-building, information services, etc. - be integrated in a mutually supplementary and complementary manner.

Programme on plant level co-operation for the transfer of technology

Creating mechanisms for the transfer of industrial technology and know-how from developed to developing countries has been one of the approaches to upgrading technological capabilities in developing countries. UNIDO's Technology Programme "Plant-Level Co-operation for the Transfer of Technology to Small- and Medium-Scale Enterprises" is one of the activities in this field. The objective of this programme is to match enterprises from developed and developing countries as co-operation partners and promote technology transfer agreements. It envisages mobilizing the private sector in the developed countries as sources of technology to partner enterprises in developing countries. This approach to technology transfer relies on treating technology as a marketable commodity and puts greater emphasis on the knowledge, perceptions and decisions of individual entrepreneurs as the motivating force.

There are presently three on-going projects in the programme, all of which are basically identical. Each is funded by an industrialized source country, covers three or four selected developing countries and concentrates on a particular industrial sub-sector. These projects are:

(1) Funded by Sweden in light engineering and metalworking industries - covering Egypt, Kenya and India;

(2) Funded by the Netherlands in food processing - covering China, Mexico, Sudan and Thailand; and

(3) Funded by Italy in engineering industries - covering Cameroon, Colombia, Peru and Tunisia.

The Swedish funded project is at the most advanced stage and has allowed six enterprise-to-enterprise partnerships. In brief, these are as follows:

(1) A joint venture between a Swedish manufacturer of electrical heating elements and an Indian enterprise for establishing a new plant in India to produce industrial heating elements and consumer goods using heating elements utilizing the latest technology in the field. The venture involves $US 1.2 million investment and is anticipated to alleviate the import of such items to India as well as stimulate downstream industries utilising these inputs.

(2) Technology transfer agreement between a chuck manufacturer in Sweden and a machine tool component manufacturer in India. This partnership involves the transfer of process know-how and manufacturing techniques to improve the quality of the Indian product. In subsequent phases, the Swedish partner intends to have some of their products manufactured in India under license and sub-contract some of their operations to their Indian partner;

(3) A licensing agreement between a Swedish and an Indian machine tool component manufacturer. This involves a transfer of process know-how, designs, specifications, etc. for the manufacture of colletts;

(4) A joint venture betweeen a Swedish manufacturer of industrial saw blades and an Indian partner to establish a new plant in a free trade zone in India to produce metal saw blades. The venture is expected to involve approximately $US 6 million in total investment;

(5) A licensing agreement between a Swedish machine tool manufacturer and an Indian partner to manufacture CNC machine tools in India;

(6) A licensing agreement between a Swedish manufacturer of belt conveyor systems and a Kenyan engineering company to transfer the capability to design, manufacture and erect belt conveyor systems in accordance with consumers' specifications.

UNIDO's role in executing these projects includes ascertaining the technology requirements of selected enterprises in the participating developing countries; identifying potential partner enterprises in the source country with the requisite technological expertise and interest in engaging in an international transfer agreement; assisting matched potential partners in reaching final agreements based on mutual benefit (this involves drafting agreements, mediating negotiations, etc.); and providing follow-up assistance for adaptation or training to supplement the agreement between partners. In carrying out project activities, UNIDO co-operates with counterpart organizations in each participating country.

The central concept of the programme is to assist enterprises to forge a business deal involving the transfer of industrial technological know-how. These agreements will be carried out with the partner's own risk venture with UNIDO acting as broker in identifying workable partnerships and assisting and formulating agreements. It is up to the entrepreneur's business sense to ensure that such a venture is sound and worth risking investment resources and once agreement is concluded, to strive to attain the presumed return.

The concept is an effort to exploit international technology markets to infuse modern methods and processes into the existing industrial sector in a developing country. The concept relies on the motive of technology source enterprises to penetrate markets they cannot reach directly with their products.

Transfer of technology flows

Based on information obtained through TIES on transfer of technology transactions in 1984, this article deals with technology transfer flows from the angle of collaboration type, sectoral distribution of contracts, country of origin of the imported technology, royalty rates of the contracts concluded and approved royalty payments. The countries reviewed are: Argentina, Egypt, Mexico, Peru, People's Republic of China, the Philippines, Poland, Portugal and Spain. It should be noted however that internal technology transfer transactions, i.e. contracts concluded with an indigenous company, enterprise, organization, etc. were not included in this analysis. Tables and figures will be found at the end of this Newsletter.

Type of collaboration (table 1, figure 1)

Approximately 50 per cent or more of the number of transfer of technology contracts concluded by the countries reviewed contain transmission of know-how and licensing, sale or assignment of trademarks. In this connection it is interesting to note the relatively low percentage (10.3 per cent) showed by Egypt on licensing, sale and assignment of trademarks, which is less than half the percentage shown for this type of collaboration by the other countries reviewed, even when taking into consideration the small number of agreements and the association with foreign investment. Only in the Philippines, do patent licensing contracts represent more than 10 per cent (17 per cent) of the number of contracts concluded while in Peru the figure is as low as 1 per cent.

With the exception of Egypt, where contracts involving management assistance account for 33.3 per cent, both engineering and management assistance represent at a maximum 10 per cent of the contracts concluded.

Technical services range from approximately 5-35 per cent. A breakdown of these services shows that a major part of them consist of training of local personnel and labour.

Of the countries reviewed only Mexico presents transfer of, licence to, or rental of computer programmes as a separate collaboration type, which means that the actual sum or percentage of this type of agreement are not distinguishable for the other countries reviewed.

Sectoral distribution of contracts

A breakdown of the number of contracts by sector (table 2) shows that by a large majority most contracts are related to the manufacturing sector.

A further breakdown of the number and percentage of contracts, related to the manufacturing sector only, shows a concentration in percentage ranging from 54-73 per cent for products such as chemicals, petroleum, coal, rubber, plastic products and fabricated metal products, machinery and equipment (table 3).

Food, beverages and tobacco products account for approximately 20-25 per cent of the manufacturing sector in Mexico, Peru and the Philippines, while only in Argentina and Egypt does the percentage of textile and leather products amount to approximately 14-16 per cent of manufacturing contracts.

Furthermore, it should be noted that among the countries reviewed no technology transfer has taken place with respect to wood and wood products.

Country of origin of the technology imported

Table 4 and figure 2 show the technology flows by percentage of supplier countries, based on the number of contracts concluded. The USA and EEC account for an average of 73 per cent of the number of transfer of technology contracts. With the exception of the two European countries (Portugal and Spain), reviewed in this analysis, where the EEC and other western European countries account for approximately 70-75 per cent and the USA only between 17-18 per cent of the number of technology transfer contracts concluded, the USA stands out as the leading supplier of technology.

It is interesting to note that in Egypt 20 per cent of the number of technology transfer contracts associated with foreign investment was concluded with Japan, a percentage which is far above the average of 5.3 per cent of the countries reviewed.

A breakdown by region of the countries summarized as in table 4 and figure 2 is presented in table 5. It shows that the use of technology from socialist countries and Africa was very slight during 1984.

For Asia, Oceania (Japan excluded) and Latin America the percentage is a bit higher, but it should be noted that included here are also "tax havens" such as Panama, Bermuda and Barbados. In Argentina for example 25 out of 33 contracts concluded within the Latin American region were concluded with countries which are classified as "tax havens".

Royalty rates of concluded contracts

Figure 3 shows the percentage of the number of contracts by royalty rates for 1984 based on net sales.

In the Philippines more than 75 per cent of the contracts for 1984 had a royalty rate between 0-2.99 per cent, while the same royalty rate only accounted for approximately 20-30 per cent of the technology transfer contracts of Argentina, Peru and Portugal during the same period.

In Argentina and Portugal, 46.8 per cent, respectively 51.5 per cent of the number of contracts concluded during 1984, accounted for a royalty rate of 5 per cent or more, while in the Philippines only 1.5 per cent of the contracts concluded during the same period had a royalty rate of 5 per cent or more.

Approved royalty payments

Figure 4 shows the total approved royalty payments for the People's Republic of China, Egypt, the Philippines and Portugal. The People's Republic of China shows by far the largest amount (US$121,092,700), but it should be noted that it allows approved payments for a maximum of 10 years, while both the Philippines and Portugal apply a maximum of 5 years for such payments.

Moreover, as far as Egypt is concerned the total approved royalty payments are based on transfer of technology contracts associated with foreign investment where only 5 contracts out of 15 contained royalty payments.

Guide on guarantee and warranty provisions in technology transfer transactions

Further to the articles appearing in previous issues of the TIES Newsletter on individual guarantee and warranty provisions, we are presenting herewith an abstract from the chapter on training.

Comments on this subject will be welcomed by the UNIDO Secretariat, which should be forwarded to the TIES Newsletter editor. If desired, these comments may be published in a forthcoming issue.

Training

(a) Purpose and function

A complete technology transfer requires adequately trained personnel to operate the technology. For this purpose it is essential that the technology recipient's personnel has all necessary knowledge and expertise to efficiently operate the technology, maintain the plant, replace broken equipment, trace the origin of defects and undertake necessary adjustments. Therefore the adequate training of personnel for these different tasks is crucial for the effective functioning of the technology.

Training can be dealt with under a separate contract or as part of the technology transfer agreement. In this chapter training will only be discussed in the context of a technology transfer agreement and not when provided for under a purely training contract.

For developing countries in particular, which often lack skilled personnel and specialized local training facilities to carry out training, the technology supplier could very well be the main source of such training. If this is the responsibility of the supplier, he should also be responsible for and guarantee a certain quality of the level of training so that the plant can be operated without any problems.

As the supplier's personnel usually leave the site shortly after the commissioning of a plant, training of local personnel is essential. Even if the supplier is willing to provide his own key personnel to operate and maintain the technology, this would run counter to the interests of the recipient's expenditure. Above all, a technology which is not operated by local personnel will remain an exclave and cannot be absorbed, assimilated or indigenized into the technical, economic and social infrastructure of the recipient's country.

(b) Present legal situation and contractual practice

The laws of most developed market-economy countries usually leave the matter of personnel training to be settled by the parties concerned, whereas all developing countries that have enacted legislation on the transfer of technology have made specific provisions for the training of personnel, thus demonstrating the particular importance of this aspect of technology transfer.

Some laws only require the inclusion of a training programme or the like into the contract, leaving the details to the parties.

Illustrative clause 42

"Agreements for the transfer of technology shall include, whenever possible, appropriate programmes for the training of personnel." (Portugal, Technology Regulations, Section 6.3; see also Philippines, Technology Regulations, Rule CII 1.b)

The type and quality of training required is often described that it must be "appropriate" or "adequate" and that the result of such training must be the ability of the local personnel to "handle", "operate", "master" and/or "assimilate" the technology transferred "for making the best use of it". (See e.g. Venezuela, Decree 63, Article 58; Yugoslavia, Technology Law, Article 24(3)).

Illustrative clause 43

"The contractual obligation, ... shall establish the period deemed necessary to enable the recipient to master the technology by fully assimilating it and making correct use of it, and by obtaining actual results from embodying it ..." (Brazil, INPI, Normative Act 015, Section 5.4)

Some laws set out some of the requirements that must be met by the training itself such as qualification of the personnel to be trained, qualification of the personnel giving the training, the fields in which training shall take place, timetable, duration, place and methods of training.

Illustrative clause 44

"Any technical assistance shall, where necessary, include technical personnel as well as full instructions and practical explanations expressed in clear and comprehensive English on the operation of any equipment involved ..." (Zambia, Industrial Development Act 1977, Section 15d)

A number of laws also try to ensure that the training actually results in the employment of local personnel. To this end, some laws request reports on the implementation of training programmes (see e.g. Philippines, Technology Regulations, Rule VII.1.c), entitle government authorities to follow the progress being made in the training programme (Brazil, INPI, Act 015, Section 5.4.4) or set definite percentage schemes on the portion of local personnel that must be employed (see, e.g., Nigeria's Petroleum Act).

Contractual practice differs very much depending on the complexity of the technology transferred and the technical capabilities of both the supplier and the recipient. A short version may only contain the number of persons to be trained, the period and place of training and the distribution of expenses.

Illustrative clause 45

"6.1 Owner's technicians numbering up to three shall receive training at the supplier's or sub-supplier's works for a period of eight weeks each.

6.2 Round-trip air tickets for the trainees shall be paid by the owner. The supplier shall pay all expenses in the supplier's country including their pocket-money." (Contract for a bottling plant in Africa)

Such a short version leaves a number of ambiguities as to the qualification of the technicians, the field and type of training and the time of training. Thus some contracts spell out the qualification and prior experience for each person to receive training. Sometimes even the selection or prequalification test is done by the recipient together with the supplier. Such a clause would read as follows:

Illustrative clause 46

"6.1. The licensor will provide training to qualified employees of the licensee nominated by him and agreed upon by the licensor at the licensor's plant, with respect to the manufacture, quality control and packaging of the products, including on-the-job training for ... the production and control of at least ... batches from the beginning to the end.

The number and qualifications of the trainees will be as follows: ..."

The level and quality of the training may be referred to in general terms:

Illustrative clause 47

"... the training services by the transferor for the transferee's personnel will be of a quality not less than that provided by the transferor to his own personnel and adequate to meet the needs of the transferee." (WIPO, Licensing Guide, fn. 137(vi)).

The contract may also indicate details such as the language to be used, the equipping of classrooms, teaching methods to be used, the number of lessons, the number of working days, etc.

(c) Problems and possible solutions

Field of training. The contract should specify the different areas of training according to the various categories of personnel. It is important not only to train personnel in "normal" operating procedures, but also in product testing, workshop practices, emergency shutdown procedures, the solution of incidental problems, etc. Often trainees form the fundamental team which in future will train their own staff. The trainees should therefore also be given a basic understanding of teaching methods including the use of technical documentation and other media which they can use when training and organising their own staff.

Place of training. Usually training should start well in advance of the commissioning of the plant itself in order to enable the recipient's personnel to play an active role in setting up the plant. The training during this first phase often takes place at the supplier's plant. However it is essential that the technology used there is similar to the technology to be transferred. Whenever possible, it would be desirable to obtain training at a similar plant built by the supplier in another developing country. This would enable the trainee to become acquainted with specific problems encountered in operating and maintaining the technology while it was working in a developing country over a period of years. On the other hand, certain improvements and research and development activities can only take place at the supplier's home plant and this may therefore require a visit to

that country. Such a visit may be more worthwhile after the recipient's personnel has become familiar with the basic technology and is in a better position to understand and discuss the intricacies of the technology.

Time of training. In general, three phases may be distinguished.

(1) Training before the technology is actually transferred or the plant set up. This is particularly important for those who will assume supervisory functions during the setting-up phase. There are a number of other activities which may require longer training or a longer preparatory stage, such as marketing activities.

(2) Training during the pre-operational and commissioning activities at the plant site. This mainly concerns the operating staff.

(3) Training after commissioning. This is necessary in order to cope with unexpected problems, shortcomings of previous training and new developments within the branch. This type of training is often referred to as technical assistance.

As the know-how for complicated and delicate technologies cannot be transferred in a few weeks, training during the post-commissioning phase is essential.

Long-term assistance reduced to key functions is important because staff training is too short for critical jobs, even though the candidates selected may already have had industrial experience, and also because technical assistance at the start up is very brief and is given by a large team who import their know-how and from which they cannot be separated for very long.

If all the assistants leave once the performance tests have been carried out, there is a large and rapid fall-off in efficiency and production which is attributable to the operator's lack of experience.

The principle of assistance with production consists of gradually adjusting the staff trained abroad and the staff trained on site by remaining on site for the initial operating phase.

Duration of training. Training programmes should be set up in such a way as to ensure a speedy absorption of the technique. Continuing training programmes are an indication of a continued dependence on the supplier. On the other hand, a technology can only be carried out efficiently if the personnel is adequately trained. The parties should therefore agree to a realistic and flexible time schedule. The supplier may be obliged to extend training if the personnel is not adequately trained after the initial period. (This should not however result in additional payment obligations on the part of the recipient, unless the supplier can show that this extension is solely caused by factors within the responsibility of the recipient, i.e. selection of personnel against the advice of the supplier.)

Pre-qualification of trainees. In most cases, the supplier will not guarantee the successful outcome of his training, unless the pre-qualification of trainees is clearly specified. This may be a diploma and/or practical professional experience. A qualification test could also be used. The qualification criteria should be mutually agreed upon. The selection of trainees is usually done by the recipient.

A problem frequently encountered is what to do with a trainee who is not able to follow the training programme. The parties involved should provide for a procedure on how to deal with such cases by mutual consent, e.g., an obligation on the part of the supplier to inform the recipient on the progress of the trainees, and the right (or obligation) of the recipient to replace trainees who fall short of the original expectations.

Illustrative clause 48

"The client shall be informed of any trainee, who, despite the selection process, does not, during the training period, prove to have the qualities required to fulfil the job designated to him or her, so that he can be immediately replaced." (Contract for the construction of a pharmaceutical glass factory in Northern Africa)

Another problem is the danger that qualified personnel will not stay at the site, but move through choice to other localities or are moved e.g. to another area of higher national priority.

In order to overcome such problems, a directive to public enterprises in India therefore recommends the following:

Illustrative clause 49

"Adequate safeguards and stipulations should be made to ensure that the trained technicians on return are obliged to serve the sponsoring undertaking for considerably long periods so that the advantages of training are not lost to the undertaking." (India, Guidelines in connection with foreign collaboration agreements of public enterprises, 9 May 1977, Section 41e)

Qualification of trainers. Little attention is given to the qualification of trainers. Their background experience and educational abilities will strongly influence the success of training. Therefore, minimum requirements or the qualification of the trainers should also be laid down. When the prospective trainers are known, it may be useful to call them by name in the relevant contract provision.

Content and methods of training. One of the greatest concerns is that the training of the recipient's personnel is not reduced to theoretical classroom teaching, but includes practical experience in the working of the technology. The possibility of discussing questions with practitioners, of taking notes and photographs, obtaining instruction material etc. can greatly help in becoming acquainted with the technology.

Illustrative clause 50

"(a) Personnel designated by the transferee shall be given adequate opportunity to study the method of manufacture of the product at the manufacturing plants of the transferor. Such personnel shall be given adequate opportunity to acquaint themselves with the production design, production engineering, processes of production and testing of the product and with related shop practices and operations at such plants, and to discuss such production design, production engineering, process of production, testing practices and operations with the transferor's appropriate engineers and production personnel at such manufacturing plants. The transferee's designated personnel shall be permitted to make notes and sketches and to procure pertinent information and photographs in the possession of the transferor relating to the foregoing including purchase material costs and methods of quality

control which may be in use in connection with the manufacture of the product." (WIPO, Licensing Guide, fn. 164a)

Contrary to the above provision, it may be useful to further specify the "adequate opportunity" as far as possible (see, e.g., illustrative clauses above).

It may be useful to specify additional details where they may give rise to problems such as training language, hours of training, working days, equipment and educational aids to be used for training etc.

Remuneration. Different modes of remuneration for training when it is part of the main contract are used. For example, the training cost can be calculated to be included in the technology fee e.g. royalties up to a certain extent. The training costs can also be paid separately, for instance as a fee per trainee per day. This last mode of remuneration is a common practice when e.g. training a team of trainees is carried out abroad at the supplier's premises or at other similar premises when the supplier does not have any training facilities of his own.

When training is provided on site in the recipient's country by representatives of the supplier payment is not calculated as a training fee, but as a fee for covering the salary and daily allowance for living expenses of the supplier's respresentative(s).

From the recipient country's point of view solutions which save foreign currency expenses are often preferable. The supplier may also have an interest that the recipient will at least provide accommodation and other local facilities required for the supplier's personnel. This solution may more easily overcome problems associated with local regulations, availability of resources, etc. In any case, the training provisions should have clear stipulations on the various expenses of the personnel of both supplier and recipient, such as: local living allowance, accommodation, transportation, medical care, taxes, import of household essentials and foodstuffs etc.

Dissemination. From the recipient's point of view the dissemination of knowledge acquired by the trained personnel both at the enterprise level and possibly also at the country level is of particular importance. In order to be able to fulfil this task, trained personnel should not only become acquainted with the technology but should also learn how to train others in that technology.

Alternatives. The supplier may not always be able to provide for training if, for example, he is a contractor and not running his own plant. Apart from that, the recipient may be interested in acquiring information and training independently of the supplier. Thus a third party may be better suited for this task. This third party could be another supplier in a developed country, but it could also be a producer or a consultancy firm in a developing country or even the recipient's country itself. Some national laws already prescribe to using already existing local facilities to the extent that they exist. In some cases, international organizations or other non-profit-making institutions may be able to provide training facilities. An important supplement to training may be a system of exchanging experience and information among recipients, but in most areas such information systems from the recipient's viewpoint are not yet very effective, if they exist at all.

(d) Checklist

1. Field of training
   - Production
   - Design
   - Maintenance
   - Repair
   - Marketing
   - Training others
2. Place of training
   - Supplier's plant
   - Recipient's plant
   - Plant of third parties
   - Similarity with the technology acquired
   - Plant in effective working for several years
   - Up-to-date plant
   - Access to recent research and development
3. Time of training
   - Before transfer of technology
     - Supervisory personnel
     - Preparatory activities
   - During transmission
     - Participation in supervision
     - Participation in commissioning
   - After transmission
     - New developments
     - Unexpected difficulties
     - Adaptation
4. Duration of training
   - Full comprehension
   - Continuing dependence during training
   - Expenses
5. Prequalification of trainees
   - Qualification
   - Professional experience
   - Qualification procedure
   - Responsibility for selection
   - Replacement
   - Continuity
6. Qualification of trainers
   - Qualification
   - Professional experience
   - Specific persons
7. Content and methods of training
   - Theoretical
   - Practical
   - Watching, doing, asking, discussing
   - Designs, photographs, notes, drawings
   - Teaching methods
   - Teaching aids, equipment
   - Language
   - Training hours
   - Working days
   - Size of groups

8. Remuneration

   - Living allowance
   - Transportation
   - Accommodation
   - Medical care
   - Additional equipment
   - Currency
   - Remittances abroad

9. Dissemination

   - Teaching ability
   - Right to pass on information

10. Exemptions

11. Legal requirements

   - Programme of training
   - Implementation reports
   - Maximum duration
   - Minimum percentages of local personnel to be employed

12. Legal consequences in case of failure

13. Alternatives

   - Other suppliers
   - Other recipients
   - Other consultants
   - International organizations
   - Non-profit-making institutions

* * * * *

Technology Advisory Services (TAS)

Further to the article on Technology Advisory Services (TAS) which appeared in Issue No. 32, we felt our readers may wish to know a little more about this service and print hereunder some relevant information.

Background

Since the industrialization of developing countries depends heavily on access to imported technology, the strengthening of negotiation capabilities has become a major issue for the recipients of technology. Under the Technology Programme, UNIDO has been carrying out extensive work to assist developing countries in this field.

The main components of such work are:

(a) Assistance in setting-up and upgrading infrastructure for transfer of technology evaluation and acquisition;

(b) Seminars, workshops and training materials on transfer of technology negotiation;

(c) Technology advisory services (TAS) to provide ad hoc advice on concrete problems of technology acquisition and negotiation.

Scope of TAS

Developing country governments often encounter difficulties in the negotiation of technology contracts, particularly in evaluating the terms and conditions of technology transfer contracts. TAS was designed to provide rapid, objective and impartial advice to governments of developing countries in the negotiation of the different types of technology contracts, particularly for major industrial projects. TAS are prepared to cover all relevant issues related to technology acquisition through contractual arrangements, including assistance in the evaluation of proposals and selection of suppliers, preparation for negotiation, drafting of agreements and advice during negotiation.

TAS services have in the past been provided in such areas of transfer of technology transactions as joint ventures, turn-key deliveries, licensing agreements and franchising services. Such services have been welcomed by governments and have helped to reduce technology transfer payments and improve conditions of technology transfer.

Recent trends in TAS

The main thrust of TAS is to provide impartial advice to negotiators so that fair and reasonable conditions reflecting internationally acceptable practices may be achieved.

This kind of approach has even induced the suppliers of technology to regard TAS as a means of facilitating the negotiation of agreements with the recipient counterparts in developing countries. In this context an increased trend in demands for TAS to advise on negotiations has been observed, and TAS has been instrumental in impartially assisting both negotiating parties to bridge their positions and to achieve mutually advantageous deals. The Technology Programme of UNIDO has also expanded the scope and flexibility of TAS outputs, by also providing a desk service to provide advice from headquarters on selected topics of negotiation, to review technology contracts, to supplement the analytical work carried out by recipients or by the regulatory authorities for technology transfer in developing countries.

TAS, pool of expertise

TAS services are based on the services of specialized UNIDO staff and selected outside consultants and are supported by the contributions of the different branches and units of UNIDO, thus combining experienced negotiators of technology agreements with technical experts in various industrial fields.

A unique advantage of TAS is the possibility of easy access to an invaluable amount of information on conditions of agreements that can be selected from the Technological Information Exchange System (TIES).

How to obtain TAS services

All governments of developing countries may request UNIDO for TAS services. Public and private corporations in developing countries may also obtain TAS services, providing the government endorses such requests.

In principle, all services provided by UNIDO under the TAS scheme should be reimbursed to UNIDO.

Requests for TAS services should preferably be presented through the local UNDP office or the Senior Industrial Development Field Adviser. They can also be addressed directly to UNIDO, Development and Transfer of Technology Branch.

For further information please contact the Special Technical Adviser, Technology Programme, Division for Industrial Studies, UNIDO, Vienna International Centre, P.O. Box 300, A-1400 Vienna, Austria.

PUBLICATIONS

ID/325/Add.1 (85.II.B.6) Input-output tables for developing countries. Volume II. (ISBN 92-1-106205-5)

ID/325/Add.1/Abstract Abstract

Fourth Consultation on the Iron and Steel Industry
Vienna, Austria, 9-13 June 1986

ID/WG.458/1 Lignes directrices pour l'acquisition de la maitrise industrielle en siderurgie grace a la formation

ID/WG.458/2 Importance and possibilities of financing of infrastructure and personnel training in the iron and steel projects

ID/WG.458/3 The world crisis of the iron and steel industry and its impact in the development of this industry in developing countries

ID/WG.458/4 Mini-steel plants: An analysis of their main characteristics and level of integration and the possibilities for co-operation

ID/WG.458/5 The integrated development of the iron and steel industry and the capital goods sectors in developing countries

ID/WG.458/6 Posibilidades y modalidades de desarrollo integrado entre la industria siderurgica y los otros sectores de la economia, en paises latinoamericanos

ID/WG.458/7 Integrated development of the steel industry, particularly mini-steel, linked to capital goods and agricultural machinery

ID/WG.458/8 Prospects of an integrated development of the iron and steel industry and capital goods: east and southern African countries

Second Consultation on the Pharmaceutical Industry
Budapest, Hungary, 21-25 November 1983

ID/WG.393/14/Rev.1 Technical profiles for production of pharmaceutical dosage forms

UNIDO/PC.131 Meeting on enterprise-to-enterprise co-operation within the Latin American plastics industry, Buenos Aires, Argentina, 4-6 November 1985. Report

UNIDO/PC.132 Expert group meeting on the preparation of guidelines for the establishment of mini-plants on iron and steel with special emphasis on Africa, Vienna, Austria, 2-5 December 1985. Report

UNIDO/IS.584 Policy and institutional obstacles to south-south trade in manufactures

UNIDO/IS.585 External indebtedness: Another dimension of the African debt

UNIDO/IS.589 Structural determinants of south-south trade expansion: Their implications for the triangular industrial trade and co-operation among OPEC, NICs and LDCs

UNIDO/IS.591 A statistical analysis of the sources of change in manufacturing value added by industry and region in 1963-1980: A decomposition approach

UNIDO/IS.593 Marine biotechnology and the developing countries

UNIDO/IS.594 Analysis of the energy sector in relation to industrialization scenarios for the year 2000

UNIDO/IS.595 UNIDO economic research services. Restructuring of the Mexican textile industry: requirements and policy options

UNIDO/IS.596 Guidelines for the formulation of national industrial and technological information policies - based on Korean experiences

UNIDO/IS.597 Guidelines for the establishment or redesign of industrial and technological information service system, including selection of software and hardware

UNIDO/IS.600 Potential applications of composite materials and associated technology in developing countries

UNIDO/IS.601 Data needs for study of structural changes in the manufacturing sector

UNIDO/IS.605 Guidelines for the formulation of national industrial and technological information policies - based on Indian experience

UNIDO/IS.610 UNIDO working papers on structural change. The leather shoe industry in Sweden: Structural change

UNIDO/IS.611 New industrial technologies and human resource development in Asia: Some selected issues

UNIDO/IO/R.220 Assistance in the design of a prototype palm oil extraction press for rural areas, Guinea, Technical report: Survey on small-scale palm oil extraction and assistance in the design of a prototype press

MEETINGS

3-7 March. ICGEB - Workshop on Biotechnology and Industrial Commodities. (UNIDO Meeting), Trieste, Italy, (CWD015).

10-15 March. National Seminar on Technology Transfer. (UNIDO Meeting), Antananarivo, Madagascar, (CWD024).

24-26 March. Meeting of sessional chairmen of the Programme Committee of the Eighth International Conference of Input-Output Techniques. (UNIDO Meeting), Vienna, VIC, D0711, (CWD020).

5-16 May. First Workshop for Heads of INTIB focal points on utilization of personal computers for INTIB networking. (UNIDO Meeting), Warsaw, Poland, (CMD032).

16 June - 11 July. United Nations Commission on International Trade Law, 19th session. New York, USA. (CMU054).

18-20 June. Preparatory Committee on the Establishment of the International Center for Genetic Engineering and Biotechnology, eighth session. (UNIDO Meeting), Vienna, VIC, Conf. Rm. III, (CMD054).

23-27 June. Workshop on the development of the machine tool industry in Asian countries and the possibilities of TCDC to LDC's of the ESCAP region. (UNIDO Meeting), Manila, Philippines, (CMD055).

7-10 July. Third Expert Group Meeting on the capital goods industry in Latin America. (UNIDO Meeting), Santiago, Chile, (CMD056).

LETTERS TO THE EDITOR

UNIDO
Technological Information Exchange System
P.O. Box 300
A-1400 VIENNA
Oostenrijk

March 4, 1986

Dear Sirs,

In your latest published issue, your continued disclosure of the 'Guide on Guarantee and Warranty Provisions in Technology Transfer Transactions' concerned itself with Legal Title and Infringement.

(a) Purpose and Function.

In addition to the contents of your paragraph, I would suggest that the licensee requires to know to what extent there is protection as to his right to use the contracted technology in the production and sale of the contract products. He should know his position in this respect with regard to the benefits he may have of know-how that is patented as well as with regard to know-how that is protected by other means.

The value of the technology may depend on the extent in which it provides a monopoly, but also on the extent the exploitation of the same is or is not hampered by third parties who allege infringement of their rights as a consequence of production or sale by the licensee.

The process of negotiation shall identify the requirements of the licensee and the possibilities of the licensor to meet the same.

The article could deal additionally with the position of know-how not being the specific subject of rights of industrial property.

In this case the parties to a technology transaction should take into consideration the consequences of infringing other parties' rights (of industrial property).

It is not so much the invalidation, but becoming part of the public domain that asks for proper arrangements.

Yours faithfully,

Th. C. M. van Kampen
Emmasingel 20
6301 BC VALKENBURG AAN DE GEUL

ANNEX 1

CONTRACTS COVERING THE TRANSFER OF TECHNOLOGY, PATENTS AND TRADE MARKS WHICH HAVE BEEN APPROVED - BROKEN DOWN BY SECTOR OF THE ECONOMY

Period: 1981-1984

CIIU	SECTOR OF THE ECONOMY	1981	1982	1983	1984
1110	Crop and livestock production	-	-	1	2
2303	Mining of non-ferrous minerals	-	-	-	1
3112	Manufacture of dairy products	-	1	-	1
3114	Processing of fish, crustaceans and other marine products	-	1	2	-
3115	Manufacture of vegetable and animal oils and fats	1	-	-	3
3116	Milled products	1	-	-	3
3117	Manufacture of baked goods	1	-	4	1
3118	Sugar plants and refineries	1	-	-	-
3119	Manufacture of cacao, chocolate and confectionery	-	-	-	1
3121	Processing of sundry food products	4	1	1	4
3131	Distilling, rectifying and blending of spirits	6	1	-	2
3133	Malted drinks and malt	-	1	-	-
3134	Non-alcoholic drinks and gaseous waters	18	9	2	10
3140	Tobacco industry	-	-	2	-
3211	Spinning, weaving and finishing of textiles	2	3	4	4
3213	Manufacture of knitted fabrics	-	1	-	-
3215	Lace making	-	-	-	1
3220	Manufacture of clothing, except footwear	2	2	1	1
3240	Manufacture of footwear, except in moulded or vulcanized leather or plastic	1	-	1	1
3411	Manufacture of wood pulp, paper and cardboard	-	2	2	-
3420	Printing, publishing and related industries	-	-	-	1
3511	Manufacture of basic industrial chemicals, except fertilizers	-	3	1	-
3512	Manufacture of fertilizers and pesticides	4	3	1	1
3513	Manufacture of synthetic resins, plastics and artifical fibres, except glass	2	2	-	-
3521	Manufacture of paints, varnishes and lacquers	4	3	3	-
3522	Manufacture of pharmaceuticals and medicines	34	42	21	32
3523	Manufacture of soaps and cleaning preparations, perfumes, cosmetics and other toiletries	13	17	13	5
3529	Manufacture of chemicals (unspecified)	3	6	7	7
3530	Oil refineries	-	-	1	1
3540	Manufacture of sundry oil and coal by-products	-	-	1	-
3551	Tyres and inner tubes	3	2	-	-
3559	Manufacture of rubber products	-	-	-	1
3560	Manufacture of plastics	-	-	-	4
3610	Manufacture of earthenware, china and porcelain	1	-	-	-

(continued)

CIIU	SECTOR OF THE ECONOMY	1981	1982	1983	1984
3620	Manufacture of glass and glass products	-	1	-	-
3691	Manufacture of clay products for building	1	-	1	1
3699	Manufacture of non-metal mineral products (unspecified)	1	1	1	-
3710	Basic iron and steel production	-	-	-	1
3720	Basic non-ferrous metal production	-	1	-	-
3812	Manufacture of furniture and accessories, principally in metal	-	-	1	-
3819	Manufacture of metal products (unspecified), except machinery and equipment	-	-	1	-
3823	Construction of machinery for working metal and wood	1	2	-	-
3824	Construction of machinery and equipment for industry, except for working metal and wood	1	-	2	-
3825	Construction of office machinery for calculating and accounting	-	1	1	1
3829	Construction of machinery and equipment (unspecified), except electrical machines	4	-	1	1
3831	Construction of electrical machines and appliances for industry	2	1	-	1
3832	Construction of equipment and appliances for radio, television and communiations	3	1	-	4
3833	Construction of household electrical appliances and accessories	-	2	1	-
3839	Construction of electrical appliances and supplies (unspecified)	3	2	3	3
3843	Manufacture of automotive vehicles	4	2	1	-
3851	Manufacture of professicnal and scientific equipment and measuring and monitoring instruments (unspecified)	2	-	-	-
3909	Manufacturing industries (unspecified)	5	3	2	1
4200	Hydraulic engineering and water supply	-	-	-	1
5000	Building	2	-	2	-
6100	Wholesale trade	-	1	-	-
6200	Retail trade	-	-	-	1
6310	Restaurants, cafes and other establishments providing food and drink	-	1	1	-
6320	Hotels, guest houses, etc.	-	-	-	1
7116	Services connected with land transport	1	2	1	1
8101	Monetary institutions, central and commerical banks, etc.	-	-	1	-
8102	Other financial establishments	1	1	-	-
8103	Financial services	-	-	1	-
8323	Data processing and tabulating services	1	-	-	-
8324	Technical and architectural services	2	6	-	2
8325	Advertising services	-	1	-	-
8329	Services rendered to companies (unspecified), except machinery rental or hire	1	3	2	-
8330	Rental and hire of machinery and equipment				
	TOTAL:	136	132	92	106

ANNEX 2

CONTRACTS COVERING THE TRANSFER OF TECHNOLOGY, PATENTS AND TRADE MARKS - BROKEN DOWN ACCORDING TO COUNTRY

Period: 1981-1984

Country of transferor	1981	1982	1983	1984
Federal Republic of Germany	13	16	14	11
Netherlands Antilles	-	1	-	-
Argentina	7	4	2	5
Austria	-	-	-	1
Australia	-	1	-	-
Belgium	2	2	2	-
Bermuda	1	-	-	-
Brazil	1	-	1	1
Canada	2	-	-	1
Colombia	2	2	-	1
Chile	-	-	-	1
Denmark	-	1	-	-
Scotland	-	-	3	-
Spain	3	5	3	2
United States of America	61	57	44	51
France	5	14	5	4
Netherlands	7	6	1	7
Hong Kong	2	-	-	-
Israel	-	-	-	1
Italy	3	-	3	1
Japan	2	3	3	3
Liechtenstein	-	-	-	2
Mexico	1	-	-	-
Panama	3	1	-	1
United Kingdom	8	3	5	5
Sweden	1	1	-	-
Switzerland	10	15	6	8
Uruguay	1	-	-	-
Venezuela	1	-	-	-
TOTAL:	136	132	92	106

ANNEX 3

PAYMENT OF ROYALTIES RELATING TO THE TRANSFER OF TECHNOLOGY AND TRADE MARKS - BROKEN DOWN BY SECTOR OF THE ECONOMY

Period: 1981-1984
(in US dollars)

CIIU	1981	1982	1983	1984
1110	----------	298.59	----------	----------
3112	286,23[illegible].93	309,509.36	243,517.80	286,062.16
3114	----------	160,562.15	----------	----------
3115	71,186.79	190,919.40	284,533.52	376,467.03
3116	----------	----------	25,017.56	6,962.89
3117	50,160.00	48,600.00	7,569.52	19,561.72
3119	----------	----------	1,655.84	2,505.54
3121	110,925.83	130,856.87	65,131.31	113,678.95
3131	20,683.63	15,352.54	6,260.62	8,320.26
3140	158,281.61	171,2[illegible]1.33	141,897.60	85,217.32
3211	342,883.65	288,6[illegible].08	117,802.33	52,604.90
3213	3,588.45	3,150.00	5,204.18	- 3,150.00
3215	6,393.35	7,076.06	805.57	----------
3219	3,946.07	4,512.20	1,422.48	812.79
3220	115,248.72	105,534.25	41,578.64	54,677.16
3240	----------	594,960.01	----------	----------
3411	63,235.46	188,022.08	9,000.00	58,320.00
3511	424,559.53	259,018.66	389,454.60	379,636.05
3512	6,146.09	7,644.73	14,233.95	455.85
3513	253,843.05	1,772,800.55	318,865.92	328,414.68
3521	86,342.74	93,963.69	65,401.64	153,633.57
3522	555,022.98	828,448.48	612,627.47	588,526.49
3523	280,739.29	719,201.45	824,344.05	865,550.09
3529	241,715.66	243,796.97	192,558.18	306,210.66
3530	----------	7,591.45	----------	----------
3540	----------	6,963.87	----------	----------
3551	319,644.91	322.681.16	311,432.34	391,982.18
3560	2,261.88	----------	2,563.94	2,402.76
3610	----------	12,174.47	2,326.67	----------
3691	9,956.27	145,523.41	136,268.77	139,865.12
3692	134,568.72	----------	----------	----------
3699	----------	9,196.82	----------	----------
3710	32,036.65	40,292.12	----------	----------
3720	----------	----------	30,348.58	78,328.74
3811	1,587.20	----------	----------	----------
3813	102,914.00	132,634.73	104,937.25	129,257.20
3819	57,892.26	88,110.88	12,468.90	5,596.32
3821	----------	12,907.55	1,172.89	2,281.63
3822	6,763.04	----------	----------	----------
3823	----------	----------	----------	28,073.96
3824	31,867.18	179,883.56	18,888.30	91,493.76
3825	1,428.32	5,517.41	----------	2,681.00
3829	18,273.46	15,894.77	10,367.29	10,112.00
3831	83,906.68	43,155.84	39,391.06	44,890.12
3832	42,080.90	2,188.83	----------	----------
3833	----------	16,407.08	2,108.71	33,230.67
3839	----------	269,396.05	----------	91,603.92
3843	72,903.04	79,421.31	15,045.80	28,949.12

(continued)

CIIU	1981	1982	1983	1984
3844	5,029.79	8,132.13	2,658.21	2,558.37
3851	----------	4,343.88	2,883.51	2,632.78
3909	9,113.56	202,758.44	37.156.15	62,016.69
4200	8,473.75	2,643.36	639.17	----------
5000	----------	----------	5,498.18	395.25
6310	----------	26,013.97	71,232.60	55,525.82
7116	3,049.49	3,181.08	1,535.14	1,683.80
8101	----------	----------	----------	64,149.12
8102	----------	----------	59,764.22	----------
8103	----------	----------	----------	36,840.91
8323	----------	22,500.00	----------	22,500.00
8324	----------	49,886.30	----------	----------
8325	----------	----------	3,765.05	----------
8329	----------	10,080.00	10,080.00	10,800.00
9591	----------	----------	1,295.80	531.18
TOTAL:	4,024,888.95	7,863,661.12	4,252,711.31	5,031,151.38

Table 1: Number and percentage of contracts by collaboration type

Year: 1984

Country \ Contract	Know-how		Trademark franchising		Patent		Engineering assistance (1)		Technical services (2)		Management assistance (3)		Computer programmes		Total		No. of contracts
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.		No.	%	
Argentina	195	34.4	125	22.3	39	6.9	60	10.6	107 (5)	18.9	39	6.9	-	-	566 (10)	100	359
Mexico	155	22.1	183 (4)	26.1	45	6.4	49	7.0	183	26.1	42	6.0	44	6.3	701 (10)	100	401
Peru	79	32.0	82	34.0	2	1.0	0	0	76 (6)	30.5	5	2.5	-	-	244 (10)	100	104
Philippines	56	30.3	50	27.0	32	17.3	10	5.4	18 (7)	9.7	19	10.3	-	-	185 (10)	100	70
Portugal	143	43.8	89	27.2	20	6.1	1	0.3	58 (8)	17.7	16	4.9	-	-	327 (10)	100	151
Egypt (11)	14	35.9	4	10.3	3	7.7	3	7.7	2 (9)	5.1	13	33.3	-	-	39 (10)	100	15

1) Basic and detailed engineering
2) Construction set up, equipment, repair, maintenance, training, quality control
3) Management of construction set up, start-up supervision, administrative supervision, marketing, production supervision
4) Including trade names (14) copyright (15)
5) Including training 35
6) Including training 49
7) Including training 14
8) Including training 25
9) Including training 1
10) The total number is higher than the actual number of contracts concluded, as one contract may contain more than one collaboration type
11) Only transfer of technology contracts associated with foreign investment

Table 2: Number of contracts by sector

Year: 1984

Sector \ Country	Argentina	Mexico (1)	Peru	Philippines	Portugal	Spain (2)	Egypt (4)	P.R. of China (5)	Poland
Agriculture, hunting, fishing	11	3	2	2	2	46	0		
Mining	7	14	1	2	1	15	1		
Manufacturing	311	289	96	63	138	535	14		
Electricity, gas, water	10	6	1	0	0	82	0		
Construction	4	0	0	1	2	9	0		
Wholesale, retail trade, restaurants, hotels	1	22	1	1	4		0		
Transport, storage, communication	2	1	1	1	0		0		
Financing, insurance, real estate, businesses	11	17	2	0	4		0		
Community, social and personel services	2	28	0	0	0		0		
No classification	0	21	0	0	0	89 (3)	0		
Tot. no. of contracts	359	401	104	70	151	776	15	136	0 (6)

(1) New contracts only
(2) The numbers include new, modified and extended contracts
(3) No classification
(4) Only transfer of technology contracts associated with foreign investment
(5) Only licensing contracts
(6) No transfer of technology contracts concluded during 1984.

Table 3: Number and percentage of contracts by manufacturing sectors

Year: 1984

Country / Manufacturing sector	Argentina		Mexico (1)		Peru		Philippines		Portugal		Spain(2)		Egypt(3)	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Food, beverages, tobacco	20	6.5	61	21.1	25	26	14	22.2	8	5.8	29	5.3	0	0
Textiles/leather	32	10.3	28	9.7	7	7.2	1	1.6	23	16.7	34	6.2	2	14.3
Wood, wood products	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Paper, paper products	5	1.6	15	5.2	1	1.1	3	4.8	4	2.9	9	1.5	1	7.1
Chemicals, chemical petroleum, coal, rubber plastic products	98	31.5	58	20.1	51	53.1	25	39.7	46	33.3	98	18.2	3	21.5
Minerals, non metallic	5	1.6	4	1.4	1	1.1	4	6.3	8	5.8	24	5.3	1	7.1
Basic metal industries	16	5.1	11	3.8	1	1.1	0	0	2	1.4	309	57.6	1	7.1
Fabricated metal products, machinery, equipment	130	41.8	98	33.9	9	9.3	16	25.4	42	30.4			6	42.9
Other manufacturing industries	5	1.6	14	4.8	1	1.1	0	0	5	3.7	32	5.9	0	0
Total	311	100	289	100	96	100	63	100	138	100	535	100	14	100

(1) New contracts only

(2) The number of contracts include new, modified and extended contracts.

(3) Only transfer of technology contracts associated with foreign investment.

Table 4: Percentage of contracts by supplier country

Year: 1984

Recipient country / Supplier Country	Argentina	Mexico	Peru	Philippines	Portugal	Spain	Egypt (3)	Average of the countries
U. S. A.	37.6	66.1	54.0	56.3	17.8	17.7	26.7	39.5
E. E. C.	35.3	17.2	26.0	8.5	50.0	64.6	33.3	33.5
Non-E. E. C. members (1)	11.4	[illegible].7	11.5	22.5	21.7	11.3	6.7	13.0
Japan	2.5	3.5	2.8	4.2	0	4.1	20.0	5.3
Others (2)	13.2	7.5	5.7	8.5	10.5	2.3	13.3	8.7
Total	100	100	100	100	100	100	100	100

(1) Western European countries, non-EEC members.

(2) See following table, broken down by region.

(3) Only transfer of technology contracts associated with foreign investment.

Table 5: Regional breakdown of supplier countries referred to as "others" in table 4

Year: 1984

Region	Argentina	Mexico	Peru	Philippines	Spain (1)	Portugal (1)	Egypt (2)
Latin America	9.1%	3%	3.9%	0%	-	-	0%
Canada	1.9%	3.75%	0.9%	1.4%	1.3%	0%	6.65%
Africa	0.2%	0%	0%	0%	-	-	0%
Socialist Countries	0.4%	0.5%	0%	0%	-	-	0%
Asia, Oceania (except Japan)	1.6%	0.25%	0.9%	7.1%	-	-	6.65%
Total	13.2%	7.5%	5.7%	8.5%	2.3%	10.5%	13.3%

(1) Material available not sufficient to give the percentage figures for Latin America, Africa, socialist countries, Asia and Oceania (Japan excluded).

(2) Only transfer of technology contracts associated with foreign investment.

Figure 1

Percentage of contracts by collaboration type

Year 1984

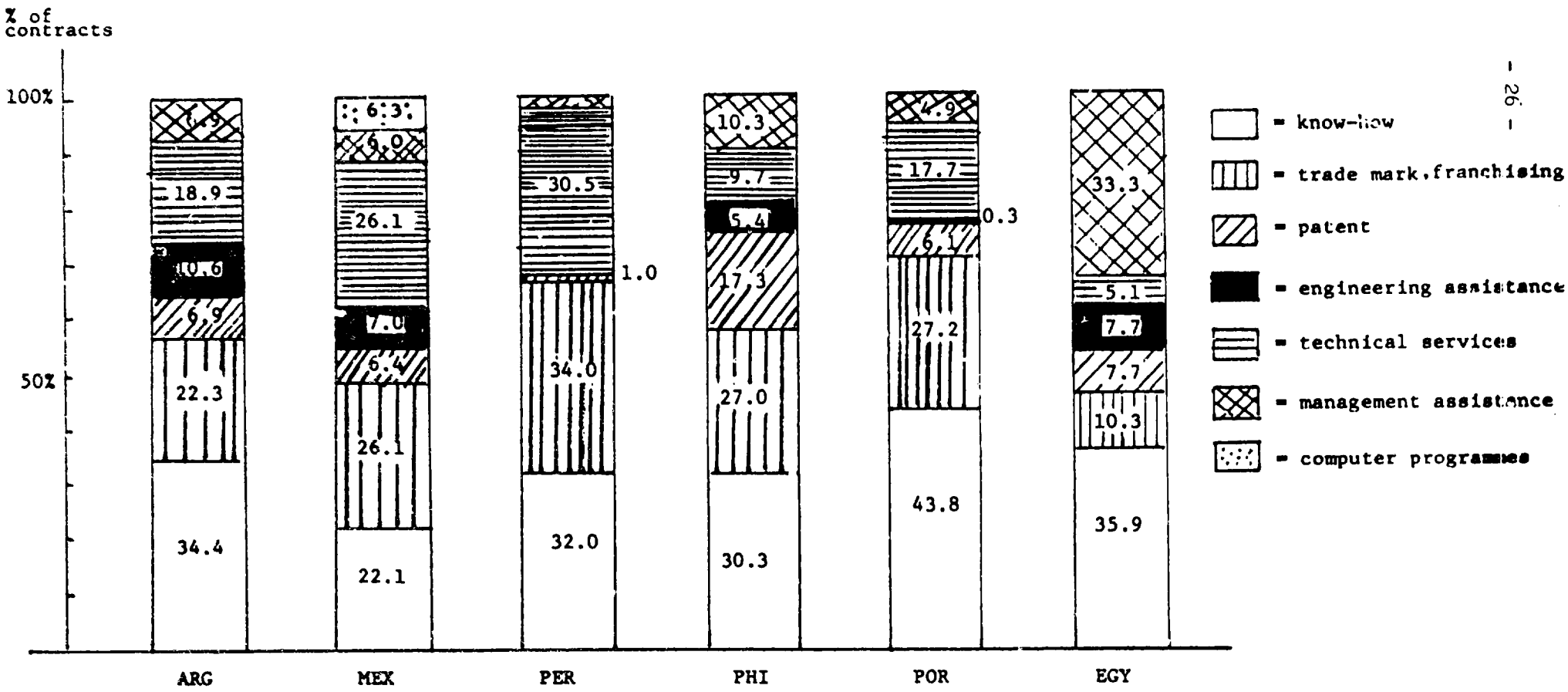


Figure 2

Percentage of supplier countries

Year: 1984

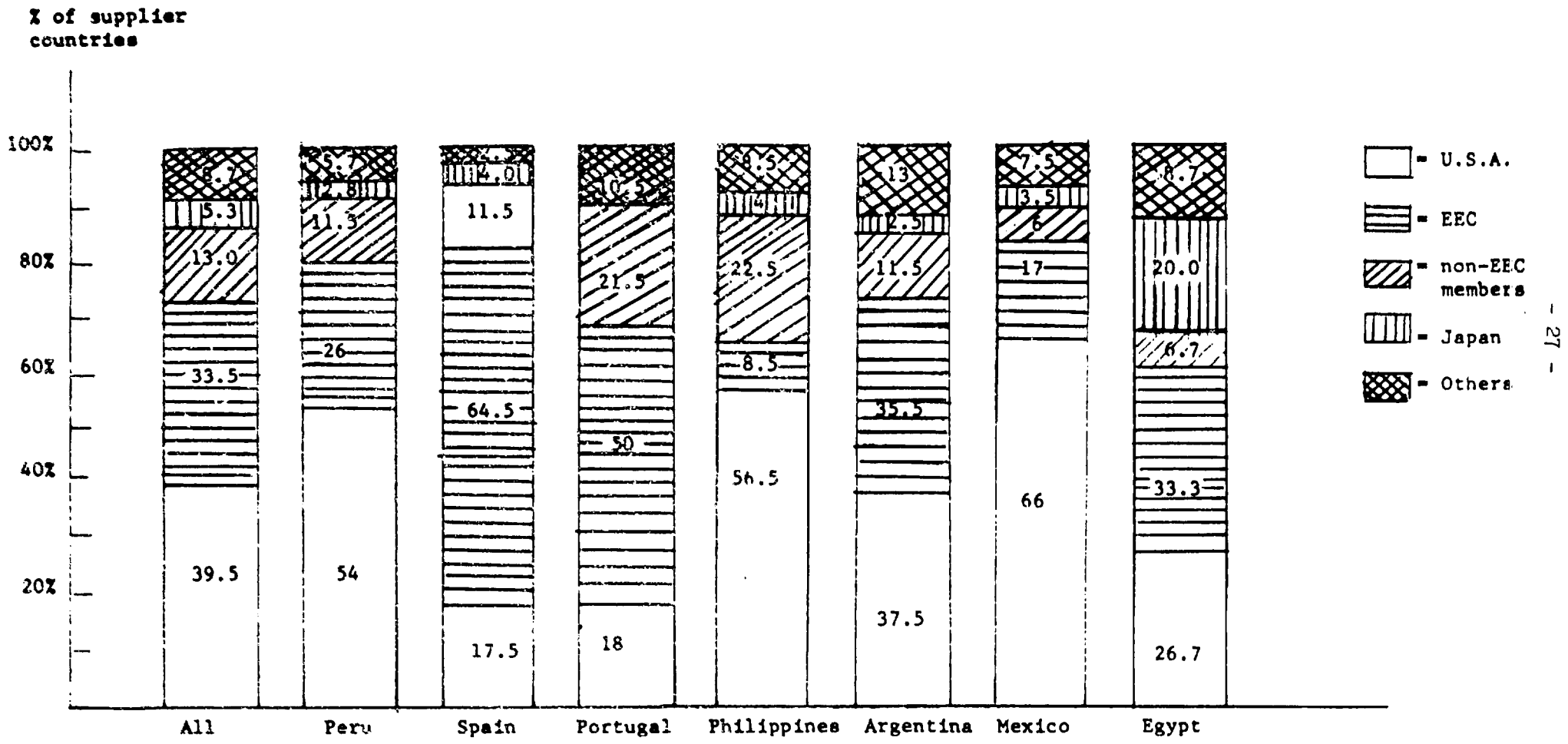


Figure 3

Percentage of contracts by royalty rate (based on net sales)

Year: 1984

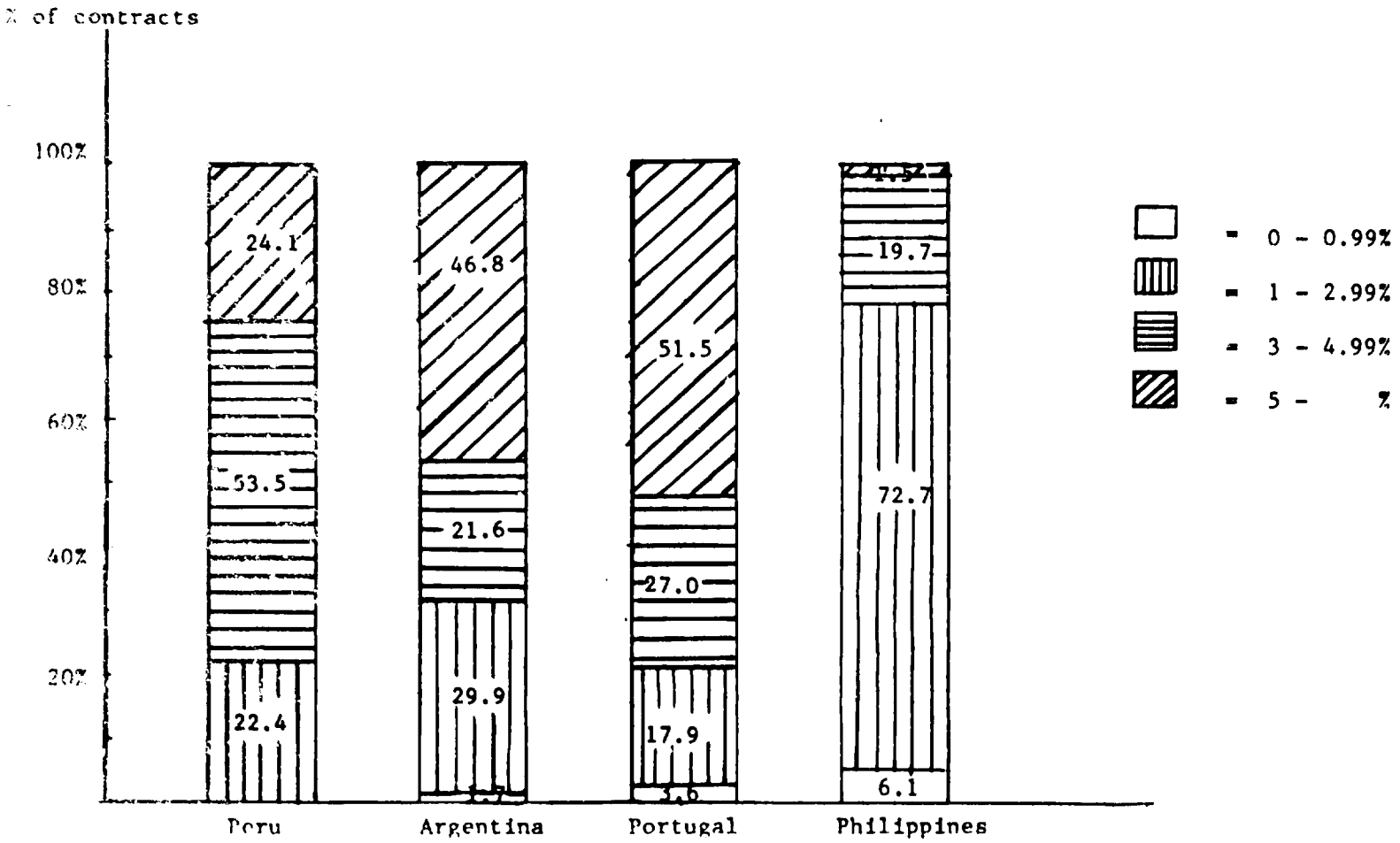
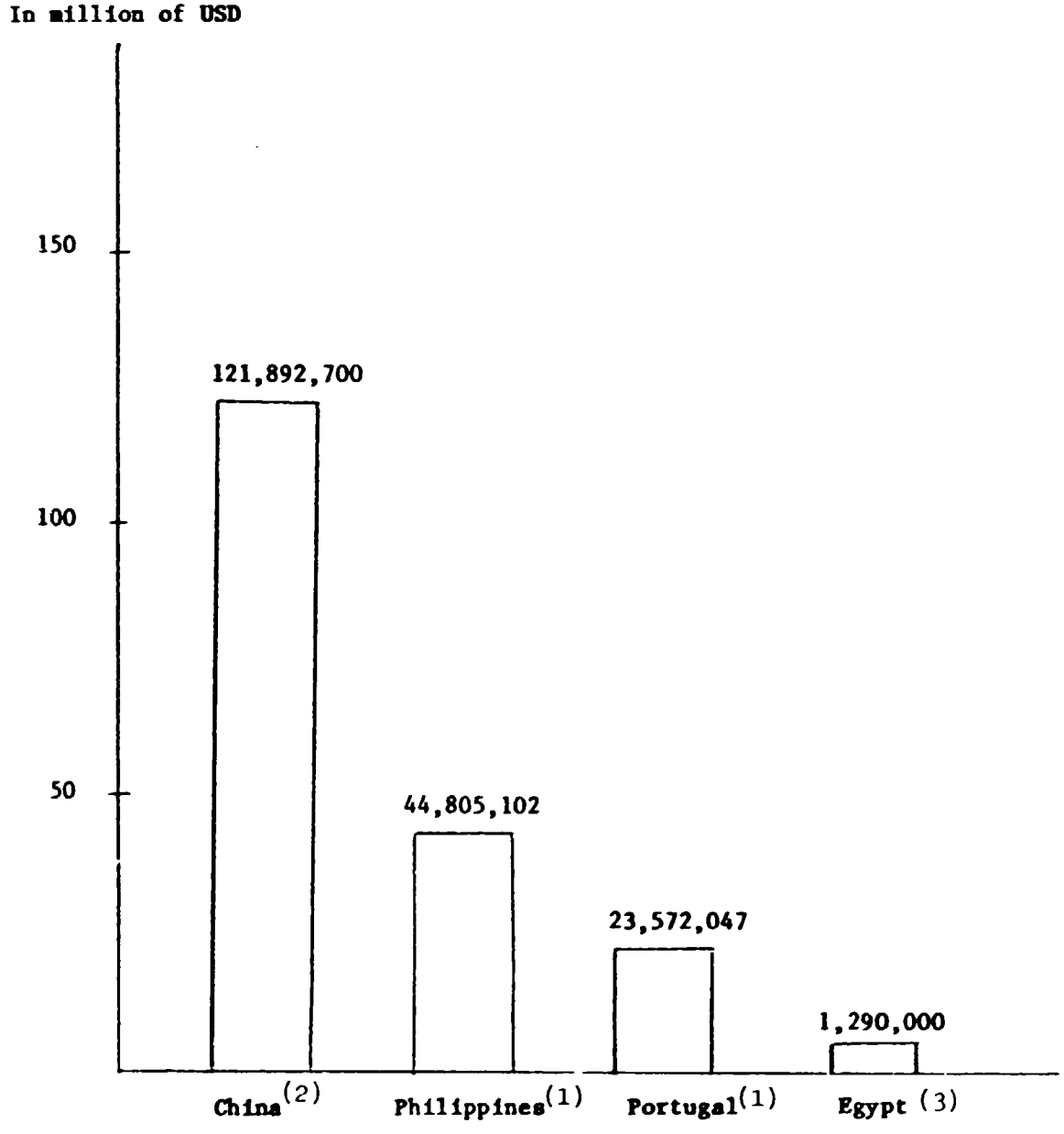


Figure 4

Total approved royalty payments

Year: 1984



(1) Approved payments max. 5 years

(2) Approved payments max. 10 years

(3) Only transfer of technology contracts associated with foreign investment.

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002	☐	Beverages	018	☐	Transport equipment	031	☐	Industrial property
003	☐	Tobacco	019	☐	Precision instruments	032	☐	Transfer of technology (licensing)
004	☐	Textile and garment	020	☐	Agricultural machinery	033	☐	Industrial research and development
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007	☐	Pulp and paper	022	☐	Utilities (including power plants)	036	☐	Industrial co-operatives
008	☐	Petrochemical and plastics	023	☐	Public services (transport, communications, tourism)	037	☐	Industrial information and documentation
009	☐	Industrial chemicals and fertilizers	024	☐	Construction (civil engineering) projects	038	☐	Industrial promotion
010	☐	Pharmaceuticals and other chemical products	**SUPPORTING INDUSTRIAL ACTIVITIES**			039	☐	Industrial training
011	☐	Rubber	025	☐	Industrial planning and programming	040	☐	Industrial management
012	☐	Non-metallic mineral products and building materials	026	☐	Industrial policies	041	☐	Industrial consulting services
013	☐	Iron and steel	027	☐	Industrial financing and investment promotion	042	☐	Development of small-scale industries
014	☐	Non-ferrous metal	028	☐	Promotion of export-oriented industries	043	☐	Industrial estates
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