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Facilitating Transfer of Technology to Developing Countries: A Survey of Home-Country Measures

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Preface

This report is based on the mandate of UNCTAD to "identify and disseminate information concerning existing home-country measures that encourage transfer of technology in various modes to developing countries, in particular to the least developed countries" (Bangkok Plan of Action, TD/386, paragraph 118) and "draw lessons from successful experiences with the transfer and diffusion of technology through FDI and other channels" (São Paulo Consensus, TD/410, paragraph 52).

The report provides an overview of developed countries' initiatives, measures and institutions as well as incentives provided to industry aimed at facilitating the transfer of technology to developing countries. It is meant to be a resource for governments, institutions, industries and policy makers seeking to identify partners through government-aided initiatives. Several examples are presented to illustrate best practices of the various home-country measures facilitating technology transfer. The report also seeks to contribute to an understanding of the issues.

UNCTAD's work in this area is ongoing, and comments on this preliminary report are invited.

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Comments on the report were received from Phillip Aerni, Anne Miroux, Maria-Susana Arano, Carlos Correa, Prasada Reddy, Torbjorn Fredriksson, Mongi Hamdi, Pedro Roffe, Yehia Soubra, Christoph Spennemann and Joerg Weber. Monica Adjivon-Conteh provided administrative support.

Staff members of Investment Division of the Development Co-operation Directorate of the OECD Secretariat provided comments on this draft in an individual capacity. The study was also submitted to the WTO Working Group on Trade and Transfer of Technology at its 10^{th} session on 10 November 2004.

The information on home-country measures in annex 1 was kindly provided by the respective agencies based on an enquiry by UNCTAD. Additional information was obtained from agencies' official websites and the national reports submitted to the TRIPS Council of the World Trade Organization.

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Abbreviations

ASEAN	Association of South-East Asian Nations
DAC	Development Assistance Committee of the OECD
EU	European Union
FDI	foreign direct investment
GATS	General Agreement on Trade in Services
GDP	gross domestic product
HCMs	home-country measures
LDC	least developed country
OECD	Organisation for Economic Co-operation and Development
R&D	research and development
SMEs	small and medium-sized enterprises
TNC	Transnational Corporation
TOT	transfer of technology
TRIMS	Trade-Related Investment Measures
TRIPS	Trade-Related Aspects of Intellectual Property Rights
UN	United Nations
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
WDI	World Development Indicators
WTO	World Trade Organization

Summary of the survey's main findings

Many developed countries have adopted measures that directly or indirectly facilitate technology transfer. These measures include financing support, training, matching services, partnerships and alliances and support for equipment purchase or licensing. UNCTAD has surveyed 41 agencies and programmes in 23 developed countries that offer home-country measures (HCMs), in one way or another, facilitating technology transfer (see table 1). HCMs are often provided as part of international cooperation programmes and/or strategic trade and investment initiatives.

Nineteen of the agencies surveyed provide support for training programmes. Of these, four provide support to enable affiliates of home-country firms in developing countries train their workers, three provide training as part of matching services and five run independent skills development programmes.

Fifteen of the agencies surveyed provide FDI-related technology transfer incentives to their enterprises. Of these 15, five require their firms to seek partnership with local firms, four include training of local partners or workers as a requirement and three require a demonstration that transfer of technology does take place. Similarly, 10 of the agencies provide technology transfer related matchmaking services.

Seven of the agencies surveyed provide financing for technology transfer. Of these, three have dedicated financing mechanisms to facilitate technology transfer. Further, four of the agencies surveyed provide venture capital support to firms in developing countries or in partnership with home-country firms.

Some of the HCMs illustrated above provide examples of best practices in facilitating technology transfer. Overall, the existing home-country programmes are fragmented, insufficient and narrow in coverage. For instance, the number of programmes whose core objective is technology transfer is small, and only a few countries are covered. Although many agencies recognize FDI as a channel for technology transfer, few include requirements to ensure technology transfer does take place in their FDI-related incentives. There is also limited information on HCMs facilitating technology transfer.

There is still a vast scope for further efforts. Such efforts may include assistance to developing countries to improve technical standards and certification systems, extensive dissemination of information on HCMs, mobilization of "business angels" and involvement of developing country firms in complex projects. Home countries may also reserve a portion of their technical assistance budget to developing countries to support measures facilitating technology transfer to small businesses, especially in LDCs.

Table 1. Summary of some HCMs facilitating technology transfer

Country	Agency	Financing TOT	FDI	Matching	PPP	Training	Venture capital
Australia	AADCP				●		
	ACIAR	●				●	
Austria	Buerges Bank		●				
Belgium	SBI-BMI		●				
Canada	CIDA-TTF	●			●	●	
	CIDA-PPI	●				●	
Denmark	DANIDA-PSD				●		
	IFU-IO		●			●	
	MCP	●				●	
European Union	RIET			●	●	●	
Finland	FINNFUND		●				
France	PROPARCO		●				
	IRD					●	
	FGEF+						
	CIRAD					●	
Germany	GTZ-PPP			●	●		
Iceland	ICEIDA	●				●	
Ireland	Enterprise Ireland		●				
Italy	SIMEST		●	●			
Japan	JETRO					●	
	JITCO					●	
	JAIDO		●				
	JICA	●			●	●	
Netherlands	FMO		●	●		●	
	PSOM		●		●		
New Zealand	NZODA		●			●	
Nordic countries	NORSAD			●			●
Norway	NORAD					●	
	NORAD -SA/SL/In			●		●	
	NORFUND						●
Portugal	ICEP-APAD		●				
Spain	COFIDES		●				
Sweden	SWEDEFUND						●
	SIDA				●	●	
Switzerland	SECO-SDFC		●	●			
	SOFI-SSF		●	●			
United Kingdom	CDC						●
	DFID				●	●	
	JEMU-TPI			●			
USA	USAID-GTN			●			
	USAID-Leland	●				●	

PPP = Public-private partnership.
+ = FGEF targets projects that benefit the environment (e.g. greenhouse gases).
Note: The table is based on information provided by or contained in official literature of the respective agencies and institutions surveyed. Several agents provide more than one measure (each measure is represented by a dot). See annex 1 for details.

Introduction

The willingness of developed countries to facilitate access to and transfer of technologies to developing countries is reflected in a number of international agreements[1]. These agreements recognize that technology transfer to developing countries is important to enable their integration into the global economy, and meet their international obligations and commitments. They also acknowledge that technology transfer is important in facilitating the creation of a sound and viable technological base in developing countries.

For instance, the General Agreement on Trade in Services (GATS) acknowledges that the increased participation of developing country members in world trade shall be facilitated through, *inter alia,* access to technology on a commercial basis (Article IV) and further calls on Members to encourage foreign suppliers of telecommunication services to "assist" in the transfer of technology, training and other activities that support the development of their telecommunications infrastructure and expansion of their telecommunications services trade (Article XXV).

Some of these instruments provide a distinction of obligations for developed and developing countries. For instance, the Montreal Protocol, while holding developing countries to their obligations, recognizes that the ability of developing countries to fulfil their obligations concerning the phase-out of ozone-depleting substances depends upon effective implementation of the financial cooperation and transfer of technology provisions (Articles 5, 10 and 10A). Similarly, Article 66.2 of the Agreement on Trade-Related Intellectual Property Rights (TRIPS) calls upon developed countries to "provide incentives to enterprises and institutions" in their territories to transfer technologies to LDCs. Although the nature of such incentives is not defined, the measures are supposed to enable LDCs "to create a sound and viable technological base".

While governments cannot alter the commercial interest of enterprises, the provision of incentives plays a catalytic role in stimulating private sector interest. To this end, countries have agreed to identify and recommend "steps that might be taken within the mandate of the WTO to increase flows of technology to developing countries" (Doha Ministerial Declaration, paragraph 37). Developed countries are also required to report to the TRIPS Council the measures they have taken to fulfil Article 66.2 of the TRIPS agreement.

Some developed countries have taken steps to implement these agreements through several initiatives and activities of national agencies that directly or indirectly facilitate the transfer of technology to developing countries and developed guideline for their firms[2]. The objective of this report is to survey these efforts with a view to encourage a broad-based response to the objectives and goals contained in international agreements.

For the purpose of this report, home-country measures (HCMs) may be defined as those measures in technology-exporting countries (including advanced developing countries)

[1] UNCTAD (2001) Compendium of international arrangements on technology transfer: Selected instruments, (Geneva: United Nations), *UNCTAD/ITE/IPC/Misc.5*

[2] See annex 2 for the OECD guidelines for multinational enterprises on science and technology.

that facilitate the transfer of technology to developing countries. Therefore, a single measure may facilitate technology transfer through different modes (see table 1).

A review of the measures adopted by developed countries shows that the incentives provided to private firms mainly fall into two categories: 1) measures encouraging technology transfer through FDI to developing countries and 2) measures encouraging the participation of home firms in public projects in developing countries. FDI related transfer of technology incentives provide risk financing and guarantees for investing in developing countries and/or entering into partnerships with firms in developing countries. However, only a few measures require home firms to demonstrate that technology transfer does take place in order to receive the incentives.

In addition, there are cases in which developed countries provide support to their domestic public institutions to transfer technology to developing countries. Such measures play an important role especially in the key sectors of agriculture, health, environment and education. These measures include support for research and development (R&D) activities, transfer of techniques, processes and products (e.g. seeds and animal varieties) to developing countries (see the cases of Australia and France).

Provision of training in both home and host countries is another common measure that is related to technology transfer. These training programmes include the exchange and training of industrial workers, scientists and experts (see the cases of Canada and Japan). There are other measures that provide matching services, information on technologies and trade opportunities.

This report is based on a survey of implementing agencies in home countries and provides an overview of HCMs that facilitate transfer of technology to developing countries. However, it is not an exhaustive account of all the measures adopted by home countries. In addition, it focuses on the measures facilitating technology transfer and not the technology transfer modes. For this reason, technology transfer through trade (e.g., subcontracting, licensing and export of machines/equipment) is not reflected as there are no HCMs facilitating such mechanisms.

I. Types of home-country measures

UNCTAD has surveyed 41 agencies and programmes in 23 countries that provide HCMs facilitating technology transfer (see table 1). The most common HCMs related to technology transfer include project financing (including through FDI and venture capital), training, matching services, partnerships and alliances and support for equipment purchase or licensing. The measures are intended to help identify possible sources of technology, acquire the required technology, adapt it to local needs and develop the local technological base. The following illustrates the different types of HCMs provided by developed countries to facilitate technology transfer.

A. Financing of technology transfer

Some HCMs directly finance technology-transfer-related activities such as the purchasing of equipment and/or licensing a particular technology by developing country firms and institutions, and training of operators and maintenance personnel. Financing may also support adaptation of these technologies to suit the local conditions and standards, and the preparation of feasibility studies, missions and project planning meetings.

One such programme that actively supports the financing of technology transfer is the Canada-Brazil and Southern Cone-Canada Technology Transfer Fund (TTF).[3] The TTF supports Canadian enterprises and organizations that wish to transfer their expertise and technology to partner organizations in Argentina, Brazil, Chile, Uruguay and Paraguay. The Fund, which is administered by the Canadian International Development Agency (CIDA), provides grants to enable the successful transfer and adaptation of Canadian technologies in partnership with local organizations.

About CAD$18 million was used to support 27 projects during the first phase of the TTF (1996-2001). Of these projects, 13 were in the areas of education, health, labour and agriculture (income stabilization), while the remaining 14 were in various areas of economic activity. Technologies transferred included equipment, and planning and management expertise as well as training of users.

For example, the Fund provided CAD$1.1 million to support the strengthening of a Gas Centre of Excellence,[4] the training of Brazilian experts and the provision of technical assistance to two Brazilian companies. The project was jointly supported by CIDA and Brazilian Agency for Co-operation (ABC). A consortium of Canadian industries (Westcoast Energy/Union Gas, the Southern Alberta Institute of Technology, and TransCanada Pipelines) led by the Lambton College[5] are providing their technologies and expertise to C.T. Gas, a major player in the gas industry, in collaboration with local stakeholders (SENAI, the Brazilian National Industrial Apprenticeship Service, and Petrobràs).

[3] CIDA (2001) Canada-Brazil Technology Transfer Fund Phase II, Information guide E94-312/3-2001E CIDA.

[4] http://www.acdi-cida.gc.ca; Canada-Brazil Technology Transfer Fund Phase 1.

[5] http://www.lambton.on.ca/

The Gas Centre's objective is to develop knowledge and the necessary technologies to increase natural gas usage in Brazil by creating customized natural gas services and training programmes for its industrial clients. The technologies to be developed by the centre may help convert industries currently using wood and coal to adopt natural gas as a cost-effective and safer technology.

Similarly, the Start-Up Facility, which is a part of the Private Sector Development Programme (PSD Programme)[6] of Danida (Denmark), is a funding mechanism that supports partner identification, visits and preliminary studies in the initial stages. It also covers the costs of technical assistance and training, export promotion efforts, adaptation of technology, environmental improvements and, in some cases, provides loans for equipment during the implementation stage. The Start-Up Facility also extends support to developing country firms wishing to receive assistance from Danish companies for a limited period of time or where the partner firms wish to assess the potential economic opportunities offered by the cooperation before committing themselves to long-term PSD cooperation.

The PSD programme currently operates in 10 African countries, four Asian countries and two Latin American countries. The programme has facilitated the transfer of manufacturing and/or process technologies in food, pharmaceutical, steel, chemical and agricultural technologies, among others.

For example, Best Foods Ltd. of Bangladesh needed to upgrade its technological base, but it was difficult to attract a developed country firm as a partner. However, the PSD Coordinator in Bangladesh contacted Herning Vorgod Biscuits of Denmark in 1999 to explore the possibilities for cooperation with Best Foods. The partners agreed to first make use of the Start-up Facility to support visits and training of technical staff from Best Foods at Herning Vorgod Biscuits' facilities in Denmark. The transfer of Danish technology and management training has proved profitable for both partners. By 2002, they had established a long-term cooperation.

B. Technology transfer through FDI

Foreign direct investment is one of the channels of technology transfer to developing countries. Foreign affiliates may bring new opportunities and challenges that may encourage suppliers to innovate. They may provide direct training to suppliers and retailers of their products and services. In addition, the movement of manpower between different firms could transfer management and marketing techniques. These could induce higher efficiency in the utilization of resources (e.g. human and financial) that will entail further adaptation of competitors to survive in the new environment.

A number of home countries encourage their firms to invest in developing countries through provision of incentives. Although many of these incentives aim at promoting internationalization of their firms, in some cases, home-country governments require their firms to show evidence of technology transfer to developing country in order to receive the incentives, while in other cases there is no such requirement. Some of the requirements such as training of local personnel, transfer of machinery and equipment, linkages with the local

[6] http://www.psdprogramme.dk

firms and local supplier networks are considered important in facilitating technology transfer through FDI.

While host-country incentives and environment play a vital role in attracting FDI, home-country initiatives that reduce the risks of investing in developing countries can also facilitate investment flows. For example, FinnFund,[7] a state-owned finance company, plays an important role in promoting investment flows to developing countries. Finnfund invests primarily in Finnish companies or long-term customers, suppliers and subcontractors of Finnish firms and/or companies that license Finnish technology (see annex 1 for details).

One example that illustrates the activities of the Finnfund in facilitating the transfer of technology through FDI is the case of A.T. Biopower Company[8] in Thailand. Biopower is a 20-megawatt plant that will convert rice husks into electricity for sale to the Electricity Generating Authority of Thailand (EGAT). The plant is estimated to cost Euro 20 million and FinnFund is one of the major shareholders. Other major investors include Al Tayyar Energy Ltd., Private Energy Market Fund, Flagship Asia Corporation and Rolls-Royce Power Ventures. Thailand produces about 20 million metric tons of rice annually. Disposing the rice husks after the milling is a major problem. This power plant will pay millers a fair price for the husks, create jobs, and generate electricity and profits for the investors. At the same time it will eliminate the current difficulties in disposing the rice husks. This case demonstrates that, with appropriate incentives by home countries and their partners, FDI can be tailored to deliver emerging technologies to meet developmental challenges that industry would not risk taking alone.

Similarly, technology diffusion could also be promoted through the involvement of local firms. In this case, the Engineering Business Services Unit of Electricity Generating Authority of Thailand is providing the engineering services that include pre-construction designs and environmental assessment. Several skills are being gained in planning, designing and constructing the plants through the involvement of various players with diverse skills and experiences. Several other agencies have similar programmes (see annex 1).

The case of the Swiss Organization for Facilitating Investments (SOFI)[9] illustrates the importance of provision of information, business planning and funding to SMEs and the role SMEs can play in international technology transfer. SOFI, founded in 1997 by the Swiss State Secretariat for Economic Affairs (SECO) in cooperation with KPMG, is responsible for promotion of investment by Swiss SMEs with partners in developing countries and in transition economies. SOFI organizes conferences and missions, identifies business opportunities, provides information, conducts partner searches and offers consulting services. In addition, SOFI manages the SECO's Start-up Fund (SSF) which offers loans to Swiss SMEs in the start-up phase of their operations in developing countries and may cover up to 50 per cent of the project costs.

For example, Crissier, a Swiss firm that offers a complete range of temperature- and pressure-measuring instruments used in the petrochemical, pharmaceutical, food processing

[7] http://www.finnfund.fi/ and the FinnFund (2003) *Annual Report*.
[8] http://www.atbiopower.co.th/indexe.html
[9] www.sofi.ch/

and manufacturing industries, wished to move into the East Asian market. SOFI advised the company on how to structure the project and access SSF, as a potential funding source. SOFI counselled the firm through the application process for a loan from the fund. With SOFI's support, the company was able to secure co-financing for equipment, materials and operating expenses.

The manufacturing facility in Shanghai is a joint venture with a private Chinese company[10] that has been producing and selling temperature measuring instruments for ten years. Several local employees have been trained in Switzerland and they, in turn, transferred their know-how to the local workforce.

SOFI has framework agreements with over 60 countries in Africa, Asia, Central and Eastern Europe and Latin America. The organization has been involved in over 300 successful projects. According to its list of recent projects,[11] about 54 per cent of the projects are in agriculture and food processing and the rest are in manufacturing, software engineering and genomics.

C. Matchmaking and provision of information on technologies

One of the main challenges faced by developing countries is to identify the most suitable technology from out of several alternative technologies and multiple sources of technologies. This is important especially in those areas where the technologies are changing rapidly. Matching those who possess the necessary technologies with those that need them may be difficult and costly for developing countries with limited sources of information.

The importance of matchmaking in facilitating the transfer of technology is illustrated by the activities of United States-Asia Environmental Partnership (US-AEP),[12] a public-private interagency partnership, supported by the United States Agency for International Development (USAID). Founded in 1992, US-AEP brings together American business enterprises and potential Asian customers. By 2002, US-AEP had matched over 700 Asian stakeholders, attended to 5000 requests from Asia and accounted for successful transfer of about US$1.4 billion worth of technologies. In 2002, the US-AEP received the Government Award from the Environmental Business Journal in recognition of its work.

For instance, the Singapore Public Utilities Board was interested in acquiring mainly the multistage flash distillation technologies for a desalinization plant to improve the water supply. US-AEP identified and referred several U.S. firms with alternative technologies, such as reverse osmosis, to bid for the contract because there are several technologies that may be efficient and cost-effective in meeting the needs of Singapore. The Public Utilities Board chose Hyflux,13 a Singapore-based company, for the design and construction of the plant. However, Hyflux used reverse osmosis instead of the multi-stage flash distillation technology.

[10] http://www.sofipro.ch/
[11] http://www.sofipro.ch/index_2.html
[12] http://www.usaep.org/
[13] http://www.hyflux.com/

Similarly, US-AEP worked with the American firms to identify cost effective and commercialized technologies to remove arsenic from drinking water in India, together with the main local stakeholders (Central Ground Water Board and Rajiv Gandhi Drinking Water Mission). Approximately 200 million people are exposed to arsenic poisoning due to contaminated water in some rural parts of India and Bangladesh. Arsenic poisoning could cause cancer of the skin, lungs and bladder, and may lead to death.[14]

The stakeholders selected two firms with compact treatment systems for arsenic removal as they met the special needs of the community. Approximately, $4 million of water treatment equipment was purchased from Apryon Technologies and Water Systems International. Apyron Technologies15 has been working in India for almost 3.5 years now and sells an integrated water treatment system that provides safe water on demand (at 8-12 litres/minute), easy to maintain by the villagers and in no need of electricity. Indeed, an advanced technology developed for the American urban homes has been adapted to meet the challenges of rural communities in India.

D. Promoting public-private partnerships

Public-private partnerships present a unique opportunity for combining the entrepreneurial, innovative and efficiency of private firms and the flexibility of public institutions to deliver services especially in neglected areas. These partnerships so far have been in limited areas.

The Public Private Partnerships (PPP) programme managed by the Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) promotes technology transfer to developing countries by providing support to firms in developed countries to take up projects to be implemented in developing countries (see box 2). GTZ offers its experience, local contacts and financial support, while the private partner provides technical assistance to projects that are jointly planned, financed, and implemented with the local institutions.

The partnerships in the health sector[16] provide excellent examples of facilitating access to technologies and their transfer. Developed country governments have provided funding to research and development (R&D) institutions and the private sector to develop and produce drugs, vaccines and diagnostic kits. Public support is largely in terms of financing research, conducting trials and mechanisms for delivery of services to the end users. Some of the clinical trial sites are located in developing countries, passing on information and skills needed to manage trials.

E. Access to venture capital and technology transfer

Venture capital plays a central role in facilitating technology development and transfer through provision of support for product development and commercialization. Venture capitalists also provide management support, business and marketing strategies, and match

[14] Ahmed, M. F., Ali, M. A. and Adeel, Z, eds. (2001). *Technologies for Arsenic Removal from Drinking Water* (Bangladesh University of Engineering and Technology and The United Nations University, Dhaka).

[15] http://www.apyron.com/

[16] Wheeler, C. and Berkley, S. (2001)."Initial lessons from public–private partnerships in drug and vaccine development", *Bulletin of the World Health Organization*, 79, pp. 728–734.

making services, among others, that improve the success of commercializing technologies and expansion of businesses.

For example, Aureos Capital Fund supports primarily SMEs in developing countries with or without partners in developed countries. Aureos has 15 offices in Africa, Asia, Latin America and the Pacific Islands. In 2003, Aureos East Africa Fund invested $4 million in Shelys Pharmaceuticals of Tanzania, which enabled the latter to acquire Beta Healthcare Kenya Ltd. By acquiring Beta Healthcare Kenya, Shelys also expanded its technological base. Aureos Capital is a joint venture between CDC Capital Partners and Norwegian Fund for Developing Countries (Norfund).

Home countries could also facilitate the formation of venture capital firms in developing countries. For example, the South-North Development Initiative has been instrumental in developing six local venture capital projects in Africa and Latin America. The shareholders are Americans and local business houses/persons. Developed countries, through their agencies and development banks, could help create venture firms in developing countries through provision of seed funds, encouraging their firms to invest in the funds and, through agreements with developing countries, create an enabling environment for venture capitalists.

F. International alliances and transfer of technology

One of the significant features of the global business environment in recent decades has been the formation of networks involving partners in different countries, each providing complementary support services and technologies. These networks are designed to reduce the risks and share the costs associated with the development of new products. Such arrangements are particularly important in areas with limited access to financing and technology.[17] Some of these alliances may involve developed and developing country institutions that may share key technologies.

For example, international alliances have played an important role in the development of biotechnology in China. In addition to the national commitment, support and funding, China has participated in the human genome sequencing project and is currently part of the International Rice Genome Sequencing Project (IRGSP),[18] an international consortium (Brazil, China, France, India, Japan, Republic of Korea, Taiwan Province of China, Thailand, United Kingdom and US) led by Japan. The EU-China collaboration[19] has provided unique training opportunities.

In addition, there are dedicated centres that promote partnerships and alliances. For instance, the Australian Centre for International Agricultural Research (ACIAR) promotes partnerships between Australian and developing country institutions. ACIAR has supported more than 50 R&D agricultural projects in Viet Nam between 1993 and 2003.[20] In one

[17] Juma, C. and V. Konde (2002). *The New Bioeconomy: Industrial and Environmental Biotechnology in Developing Countries*, (Geneva: United Nations), *UNCTAD/DITC/TED/12*.

[18] http://rgp.dna.affrc.go.jp/IRGSP/index.html.

[19] Agreement for scientific and technological cooperation between the European Community and the Government of the People's Republic of China (1998) accessible via ftp://ftp.cordis.lu/pub/inco2/docs/china.pdf.

[20] Ten Years of ACIAR in Vietnam-Highlight, 2003 (www.ACIAR.gov.au/).

project, the Institute of Agricultural Sciences of South Viet Nam worked with the Queensland Department of Primary Industries to develop and introduce a pig variety suited to Viet Nam that grows faster and produces leaner meat. The project also equipped five artificial insemination centres to support the introduction of this superior breed. ACIAR participates in projects in Southern Africa, Asia and the South Pacific, and supports international agricultural research centres such as the Consultative Group on International Agricultural Research Centre (CGIAR) (see annex 1 for details).

G. Measures to improve host-country absorptive and technological capacity

Many developed countries support human resource development in developing countries by providing scholarships for higher education in their home countries. They also provide research and equipment support to academic, research and professional institutions in developing countries. Technical assistance is also provided to industrial associations and government advisory bodies.

II. Coverage of home-country measures

As was already discussed, developed countries provide a variety of HCMs to address specific objectives (see annex 1), differing widely in scope and geographical coverage. Some of the HCMs are provided to enable firms in developed countries to internationalize, while other measures provide direct support to developing country firms. Measures that largely focus on commercial interest have fewer conditions attached than those promoting development of a productive base. For example, most programmes offering FDI-related incentives do not require benefiting home firms to enter into partnerships or demonstrate that technology transfer will take place. Such measures may be said to have largely a commercial interest.

Some HCMs target a specific region or group of countries. The Canadian Technology Transfer Fund targets only countries in the Southern Cone and Brazil. Similarly, the Danish Start-up Facility operates only in Danida-programme countries. These HCMs facilitate technology transfer only to these countries. Some developing countries, even though located in the same region, will not benefit from these measures. Although such a focus may exclude potential beneficiaries, they stimulate technology transfer and investment to regions of interest.

Most of the FDI-related measures seem to benefit the emerging markets in Asia and Central and Eastern Europe even though these measures do not deliberately target these regions. Firms in other developing countries or regions are not better placed to attract investment or partners from developed countries. For example, of the 32 projects highlighted by SOFI (see section 2.2), only 3 were in Africa.

There are two programmes, out of the 41 surveyed, specifically targeting LDCs, and none focuses on technology transfer as the core objective among the agencies and programmes surveyed. Many firms in LDCs are unlikely to attract partners from developed countries without support. The limited number of HCMs specifically targeting LDCs may reflect the importance of the home country's commercial interest.

The extent to which HCMs balance the needs of home and host countries is difficult to assess at this stage. However, most of the programmes provide support to firms and institutions in developed countries (e.g. financing, guarantees and information). There are few that provide partner searches or information to firms and institutions in developing countries. For example, four programmes require that proposals for support originate from developing countries or are co-developed with firms/institutions in developing countries (e.g. the US Leland Initiative (see annex 1)).

There are other measures whose main target is technology transfer to advance the development goals. For example, the Australian Centre for International Agricultural Research (ACIAR) promotes research partnerships and supports agricultural related research and transfer of its technology to developing countries. The Centre has produced vaccines, bred and introduced improved animal and plant varieties, and farming techniques that have made a significant economic impact in developing countries (see annex 1 for details).

Programmes that directly support developing country firms to acquire technologies through partnership or financing seem to be effective. These programmes are explicit on the nature of technologies to be transferred, how the transfer process will be managed and the goals to be achieved through the projects. For example, the US Leland Initiative, the Canadian Technology Transfer Fund and the PSD Programmes (Denmark) are good example of such HCMs.

Other measures such as matching services, support for training local workers and venture capital access play an important role in technology transfer whether they are provided as part of FDI support services or as independent measures. However, given the number and nature of measures surveyed, it is difficult at this stage to say what expertise was transferred under some of these measures. For example, US-AEP (section 1.3) is said to have matched 700 Asian stakeholders and successfully facilitated the transfer of $1.4 billion worth of technologies. The programme may be viewed to be effective in facilitating technology transfer.

Similarly, CDC Capital Partners and Norfund have invested in or stimulated the formation of venture capital firms in developing countries to fund local SMEs. The effectiveness of these measures in transferring technologies to developing countries cannot be conclusively addressed here.

III. Further efforts to facilitate technology transfer through HCMs

There is vast scope for further improvement of HCMs facilitating the transfer of technology to and help build a productive capacity in developing countries.

- Home countries could help developing countries improve technical standards and certification systems through access to and provision of testing equipment for standard setting and quality assessment.

- Provision of preferential market access for technology-intensive products, especially from LDCs, could stimulate technology transfer and diffusion. This could be supported by favourable tax incentives in home countries to facilitate FDI flows, technology transfer and development, and exports from developing countries.

- Developed countries offering preferential market access may also encourage their firms to invest in the target countries and sectors to promote technology transfer, development of marketing skills and standards. Such an effort may help developing countries to fully realize the benefits offered by preferential markets.

- Extensive dissemination of information on HCMs would enable firms/institutions in developed countries and their partners in developing countries to effectively utilize the measures. This may include the establishment of databases, use of regional associations and matching services, among others.

- Home countries could assist to mobilize "business angels"[21] to improve access to financing and facilitate technology transfer to firms and institutions in developing countries.

- Many complex projects (e.g. hydroelectric power stations and bridges) involve the use of different technologies and are sometimes supported by funds from donors. Home countries, as funding agencies, may make it a requirement on their firms to work with local firms in all stages (planning, bidding, management and execution) to facilitate the transfer of technologies.[22]

- HCMs could be expanded to include aspects similar to those of the Small Business Technology Transfer Programme (STTP) and Small Business Innovation Research Programme (SBIR) in the US. Under these programmes, selected US Departments reserve a portion of their R&D funds for awards to small businesses (less than 500 employees) and promote technology transfer. Donors may reserve a portion of their

[21] Business Angels are generally individual or private investors interested in unquoted small and medium sized businesses. They provide finance, experience and business skills and are motivated by various factors such as financial return, community benefit and overcoming a challenge. For this reason, Angels invest in the early stage of business development.

[22] Taskforce on Science, Technology and Innovation (2004). *Challenges and Opportunities for Implementing the Millennium Development Goals, Interim Report of the Task Force on Science, Technology and Innovation*, United Nations MDG project, accessible via http://bcsia.ksg.harvard.edu/.

support for technology transfer from their public institutions to SMEs in developing countries, especially LDCs.

- Home countries may also facilitate technology transfer to developing countries through trade by meeting part of the costs of technology licensing, promoting subcontracting and encouraging export of equipment and machinery especially in fields of common interest such as health, aviation and communications.

IV. South-South cooperation in transfer of technology

Developing countries have also committed themselves to work together to overcome shared challenges. The Marrakech Declaration (Morocco, 2003) recognized that "South-South cooperation is not an option but an imperative to complement North-South cooperation". Similarly, the Dubai Declaration for the promotion of science and technology (Dubai, 2002) called for the "identification, documentation and networking of institutions and individuals who have made significant progress in the field of biotechnology", provision of funding through development banks, collaborative programmes and networking. The Dubai Declaration also called on "international institutions such as FAO, UNCTAD, UNDP, UNESCO and others" to increase their support to developing countries and concerted efforts within and between nations to overcome the digital divide.

A number of the South-South initiatives are likely to occur through regional and bilateral agreements. Through these initiatives, international resources and expertise could be channels to overcome common challenges. They also concentrate limited regional resources to achieve a critical mass that could overcome national weaknesses that may hinder the rate at which technology is absorbed or utilized. Further, they may facilitate harmonization in policies that encourage technology development, transfer and use.

For example, the Organization of African Unity (OAU), now African Union (AU), launched the Pan African Rinderpest Campaign (PARC)[23] in 1986 to completely eradicate the disease (Rinderpest) on the continent. PARC coordinated national projects in 35 participating countries and assisted in improving vaccine production and quality control technologies, skills upgrade, management training, border harmonization dialogue and communication channels. Through PARC, the EU is estimated to have invested $200 million by 1999. Rinderpest, a viral disease, could wipe out up to 90 per cent of the cattle in an area and, with it, the livelihood of many families. A vaccination campaign in 22 African countries was thought to have eradicated the disease in the 1970s. However, between 1979 and 1983 more than 100 million cattle died from a resurgence of the disease. Nigeria alone is thought to have lost $2 billion dollar due Rinderpest in the 1980s.

PARC developed 4 regional emergency vaccine banks, two regional coordination centres and centres for vaccine quality control and disease diagnosis all located in African countries. It is estimated that 45 million cattle were vaccinated annually. One element that made PARC successful was its communications unit that helped sensitize farmers, veterinary experts, policy makers and donors. Several international agencies, institutions and individuals made PARC successful. It presents a good model for overcoming specific problems.

Similarly, China and Brazil agreed (1989) to develop two remote sensing satellites through the China-Brazil Earth Resources Satellite (CBERS) Programme.[24] The programme pools the human and financial resources of both countries to establish a remote sensing

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[23] D'Huys, P (1998). *Communication for development: The case of the Pan African Rinderpest Campaign (PARC) SD Dimensions* (accessible via www.fao.org).

[24] *Sausen*, M. T. (2001). *The China-Brazil Earth Resources Satellite* (CBERS), *ISPRS Society* 6, pp. 27-28.

system that is competitive and compatible with international needs. The National Institute for Space Research (NIPE) in Brazil and the Chinese Academy of Space Technology (CAST), China, are the lead agents in this programme. To boost industrial development, a clause was included that obligated the Chinese to reinvest the equivalent of the money received from Brazil to purchase Brazilian products. CBERS launched its first remote satellite in 1999 aboard a Chinese rocket from the Launch Centre in Taiyuan after 13 years of cooperation and the second on 1 September 2001.[25] China bore 70 per cent of the cost while Brazil covered 30 percent. Brazil is responsible for the development of the high-resolution cameras while China is responsible for the application platform. In addition, Brazil and China cooperate in other areas such as swapping fuel technologies and a joint venture for the construction of aircraft turbofan jets for low-cost and low-maintenance aircrafts.

With different developing countries at different levels of technological development, cooperation should increase technology transfer especially in areas of common interest. Some developing countries are quickly becoming technological leaders and should soon be in a position to assist other developing countries establish a technological base within and between regions.

For example, the International Centre for the Advancement of Manufacturing Technology (ICAMT)[26] based in Bangalore serves as the gatekeeper of appropriate and emerging manufacturing technologies. ICAMT was established by UNIDO in cooperation with the Government of India to promote manufacturing technologies for industrial competitiveness in developing countries and to foster international cooperation. The Government of India, as the host country, provided the premises and $1.3 million while UNIDO also allocated some funds for this purpose.

The centre promotes both North-South and South-South knowledge and technology transfer. Currently, it is involved in the generation and transfer of Indian and Asian technologies to other developing regions, mainly Africa and Latin America and the Caribbean. Recently (2002), the Centre has initiated new projects in Kenya, Malawi, Mozambique, Uganda, Zambia and Zimbabwe to provide India manufacturing technologies and expertise on low-cost housing and encourage technical cooperation among developing countries in Asia and Africa. ICAMT has also taken part in exhibitions in Africa, through the Asia-African Technology Partnership Forum, and in Latin America.

Further, some developing countries are already becoming prominent donors and investors. South Africa is becoming one of the major investors in the Southern African region. Other countries such as Brazil, China, Cuba, India, the Republic of Korea and South Africa, among others, have programmes that promote the exchange and training of personnel and attachment of trained expatriates to other developing countries.

[25] http://www.cast.ac.cn.
[26] http://www.icamt.org/.

Concluding remarks

Several developed countries provide HCMs directly or indirectly facilitating the transfer of technology to developing countries. These measures address specific objectives and differ widely in scope and geographical coverage. Several examples presented in this report have demonstrated the positive role that these HCMs can play in facilitating technology transfer.

However, these measures could further be enhanced. For instance, there is limited information available on these measures. This may influence the reach and impact of HCMs. The number of programmes whose core objective is technology transfer is small. These measures, if expanded, could assist developing countries expand their technological base. Similarly, a number of home countries provide incentive to their firms. Such HCMs could also be provided to host country firms, especially LDCs, to enable them access technologies from home-country firms.

This paper provides an overview of HCMs that could facilitate technology transfer and is not meant to comprehensively assess the effectiveness of the measures. It highlights some measures that could serve as best practices. The paper is meant to facilitate the exchange of experiences among the HCMs providers, with a view of promoting best practices. Similarly, the paper does not address the legal and regulatory issues that may influence technology transfer to developing countries. These are equally important issues that will be addressed in future studies.

Annex 1

Selected HCMs adopted to facilitate technology transfer

The cases profiled here represent a variety of HCMs adopted by countries to facilitate technology transfer. The measures discussed in this annex do not cover the entire list of all HCMs adopted by the developed home countries. The cases are based on information made available by the agencies and/or that contained in official literature.

1. AUSTRALIA

1.1 ASEAN Australian Development Cooperation Programme (AADCP)

The Australian Government's Overseas Aid Programme, in partnership with the ASEAN countries, launched the ASEAN Australian Development Cooperation Programme (AADCP) in 2002 to promote sustainable development through strengthening of regional economic and social cooperation, institutional capacities and science, technology and environmental cooperation. It includes an initiative called "Enhancing ASEAN Competitiveness" to assist ASEAN countries in improving the competitiveness of their private sector and SME development. AADCP supports linkages, partnerships, technology transfer and activities in science and technology, among other activities. It also extends support to economic policy research for the ASEAN Secretariat.

The programme supports the implementation of a range of small-scale regional development activities, proposed by ASEAN and Australian entities. It has a budget of about A$45 million to implement all its activities.

1.2 Australian Centre for International Agricultural Research (ACIAR)

The Australian Centre for International Agricultural Research (ACIAR) is part of Australia's overseas aid programme that promotes research partnerships to achieve more productive and sustainable agricultural systems in developing countries. ACIAR conducts and supports research and transfers the technology it develops to the target countries. For example, ACIAR produced a vaccine against new castle for inoculating poultry in Asia (at a cost of $3.3 million), bred canola lines for China (at a cost of $1.1 million) and introduced improved pig varieties in Viet Nam ($3.5 million). Asia accounts for about 63 per cent of ACIAR budget expenditure.

ACIAR commissions bilateral research and development; supports the International Agricultural Research Centres; provides training courses and scholarships; and communicates the results of its research activities. These include agricultural systems, agricultural development policy, crop sciences, animal sciences, post-harvest technologies, land and water resources, forestry and fisheries. ACIAR also administers Australia's $9 million contribution to the International Agricultural Research Centres, both those within and outside the Consultative Group in International Agricultural Research (CGIAR).

2. AUSTRIA

2.1 Austria Wirtschaftsservice (aws)

Austria Wirtschaftsservice (aws) is a governmental owned limited liability bank formed in 2002 by merging several previous institutions promoting private enterprise development. The aws offers subsidies and financing to Austrian enterprises, supports procurement of innovation and technologies and assists home firms to internationalize. It also provides grants for long-term partnerships between Austrian SMEs and private companies in developing countries. Since 1990, aws-related institutions have supported over 650 projects in Africa, Asia, Europe, Latin America and the United States.

The aws supports Austrian enterprises with business planning, structuring and financing as well as feasibility studies and surveys. The main instruments are guarantees for bank loans and mezzanine (subordinate) loans provided to SMEs, and guarantees for loans that finance technological innovations. The projects are individually assessed for transfer of technology and capabilities. The aws guarantees enable Austrian firms to get back part of their funds (maximum 50 per cent) if the investment project fails.

3. BELGIUM

3.1 Belgian Corporation for International Investment (SBI-BMI)

The Belgian Corporation for International Investment is a semi-public investment company that finances new joint ventures or subsidiaries, and the acquisition, restructuring and development of existing companies abroad by Belgian companies. It offers flexible financing packages and provides advice on foreign investment projects worldwide. Presently the company is not directly involved in technology transfer but facilitates the flow of FDI and thereby technology.

SBI-BMI provides co-financing arrangements such as risk capital in the form of minority participation in equity and/or quasi-equity (subordinated, profit-sharing or convertible loans, etc.), and medium to long-term loans. It also provides foreign investment advice based on the knowledge it gained through its long-standing experience in the field.

4. CANADA

4.1 CIDA's Technology Transfer Fund (TTF)

The Canadian International Development Agency (CIDA), through the Canada-Southern Cone Technology Transfer Fund, facilitates formation of long-term institutional alliances and linkages that transfer Canadian technology and know-how to the Southern Cone (Argentina, Chile, Paraguay and Uruguay). Such technology and know-how includes management systems and regulatory approaches in addition to goods or equipment.

The programme is based on a genuine partnership, cost sharing, strong local involvement and joint responsibility. The $15 million TTF-Phase II was launched in 2001. CIDA's financial contribution to projects may be used to offset the cost of the Canadian

partners' participation. The Fund does not design projects but responds to joint proposals by organizations in the Southern Cone and Canada and submitted to CIDA for consideration.

CIDA's contribution to a project represents only a part of the total cost and supports those Canadian partners that display strong organizational and managerial competencies, technical leadership in Canada, and have experience in technology transfer, and provide the best of what Canada has to offer in the field or sector of interest.

Box 1. Water management in Brazil

Environment Canada and the State of São Paulo worked together to implement a $9.75 million watershed management and wastewater treatment project that was completed in August 2001. CIDA, through the Canada-Brazil Technology Fund, contributed $3 million to support this initiative. Other participating Brazilian agencies included the Sanitation Company of the State of São Paulo (SABESP) and the Environmental Technology Sanitation Company (CETESB). The project drew on a range of relevant Canadian and private sector capacities, such as informatics tools, regulatory approaches and wastewater treatment technology.

Environment Canada coordinated the Canadian project team, which involved a wide range of expertise from the Canadian public and private sectors, while the Brazilian partner coordinated a consortium of agencies responsible for environmental preservation and the management of São Paulo's water and sewer systems. The project is expected to generate approximately $2.5 million worth of future contracts for Canadian companies.

Source: CIDA.

4.2 Private Participation in Infrastructure (PPI) and International Funding Initiatives (INC)

CIDA also runs the Industrial Cooperation Programme (CIDA INC), which provides risk-reducing financial support to Canadian firms considering an international venture in developing countries and the Local Fund for Public Sector Reform in the Southern Cone to provide short-term Canadian technical assistance (a three-year CAD$750,000 Fund administered through the Aid Section of the Canadian Embassy in Santiago, Chile).

CIDA-INC may share the costs of preliminary feasibility studies, training, environmental, social, and gender-equality management plans to increase the project's benefits for the host country. Besides a successful completion, the project must encourage economic growth through such activities as providing jobs for local workers and result in upgrading of skills. The projects must be related to transportation, energy, potable water, sewage, waste or hazardous waste management, telephone service, and gas distribution.

The CIDA also supports the Private Participation in Infrastructure (PPI) programme. It is based on the premise that since many developing countries do not have the resources for infrastructure projects and that aid budgets are being reduced worldwide, the involvement of private sector is necessary.

The maximum financial support extended will be 80 per cent of all eligible costs (travel expenses, salaries, fees and other costs (e.g. adapting Canadian equipment and manuals) related to the project). Furthermore, costs for using external financial and legal experts in developing countries can be covered up to 50 per cent. The participating enterprise must be well established and prepared for a long-term commitment to the project and the host country.

5. DENMARK

5.1 Private Sector Development (PSD) Programme

The Danish International Development Assistance (Danida) promotes long-term, reciprocal and binding partnerships between Danish firms and firms in developing countries through its Private Sector Development (PSD) programme. The main objectives of the programme are: to facilitate transfer and adaptation of technology, to promote investment and private-sector growth and to enhance the business environment in developing countries. In addition, the programme promotes improvement in work environment and environmental protection standards in developing countries for sustainable development.

The programme supplements the partner's own contributions to the partnership by financing visits of the Danish partner to the prospective host country, consultancy and feasibility studies and up to 90 per cent of the start-up costs (e.g. set-up, technical assistance and training) and technology adaptation. Similarly, environmental initiatives could be covered up to 90 per cent of the costs. The PSD Programme requires binding and long-term cooperation with the local partner and the support is "conditional on there being a genuine transfer of special competence from the Danish company to the PSD partner, not purely an export promotion arrangement".

5.2 Industrialisation Fund for Developing Countries and Investment Fund for Central and Eastern Europe

The Industrialisation Fund for Developing Countries (IFU) and the Investment Fund for Central and Eastern Europe (IØ) are established to encourage Danish enterprises to invest in developing countries and in countries in transition and to help promote private sector development, create jobs and skills and transfer of technology. The programmes participate in joint ventures through equity capital and/or loans and board membership and provide advice during the preparatory and initial phases of the investment projects. The loans and guarantees are typically provided for periods of up to five years. Additionally, the programme links investors with financial institutions such as the International Finance Corporation. The programme has a network of advisors working to improve knowledge about local conditions in many countries. Although majority of the projects are joint ventures of Danish and local partners, there is no formal requirement for local partnership and the tendency now has been that there are fewer projects with a local partner.

IFU's total financial involvement in a project does not normally exceed 30 per cent of the total investment. IFU may subscribe up to 59 per cent of the share capital of a company but always less than that of the Danish partner. Eligible host countries for IFU must be on the OECD's DAC list of development aid recipients and per capita income may not exceed $5,115 (2004). Furthermore, IFU administers an Environment and Training Fund,

financed by Danida in countries with a GNP per capita under $2,500. The Fund provides funds for personnel training, technical assistance, and measures to improve environmental and working conditions in IFU-projects.

IØ finances projects on the same basis as IFU, but in countries in Central and Eastern Europe (outside EU) and without the GNP restriction.

5.3 Danish Mixed Credits Programme

The Danish mixed credit programme provides interest free or low interest loans for financing supplies of equipment and related services for development projects, in a number of sectors, including water and sanitation, energy, health, environment, and education, as a direct transfer of established technologies to the recipient country. In addition, all the commercial contracts financed under this programme are required to have a training element focused on operations and maintenance. Therefore, local firms may be sub-contractors to make project deliveries. About DKK 300 million of interest subsidy and related financial costs are allocated annually.

The mixed credit programme comprises a tied mixed credit facility available in Danida's programme countries and other relatively creditworthy countries with a GNI per capita of less than $2,348, and an untied mixed credit facility available only in Danida's programme countries and South Africa. The two credit facilities are based on the same main principles and are thus to a wide extent subject to the same terms and conditions.

6. EUROPEAN UNION

6.1 Regional Institute of Environmental Technology (RIET)

The European Union-Singapore Regional Institute of Environmental Technology (RIET), a Singapore registered not-for-profit foundation, promotes the transfer and exchange of environmental technology and services between Europe and Asia. The EU and Singapore support RIET as a tool for the promotion of good practices in environmental management.

RIET is an international network that assists Asian economies to integrate sound environmental management policies and practices into their economic development. It provides a forum for dialogue and understanding of the Asian environmental threats and opportunities, conducts research on environmental policy, management and technology practices in Asia, and promotes business-led strategy responses.

RIET is dedicated to disseminating information on environmental management and technological best practices, eco-efficiency and green productivity. RIET helps in organizing conferences, exhibitions and trade shows, meetings, roundtables, business matching, and training.

7. FINLAND

7.1 Finnish Fund for Industrial Cooperation (FINNFUND)

The Finnish Fund for Industrial Cooperation (FINNFUND) is an institutional investor that participates via minority equity investments, investment loans and mezzanine financing in established or start-up companies operating in developing countries or in transition economies. The Fund is owned by the Government of Finland (79%), Finnvera Plc (20%) and the Confederation of Finnish Industry and Employers.

Finnfund is an active participant in project development and provides both risk capital and loans for viable investment projects. Most of Finnfund's investments are in manufacturing, but it also invests in other sectors such as telecommunications, forestry, renewable energy and services. Finnfund invests mainly in Finnish companies but it can also finance their partners such as long-term customers, suppliers, subcontractors and companies that license Finnish technology. Finnfund focuses on projects involving advanced but commercially proven technologies.

The equity investment can be up to 30 per cent of the capital of the company being financed. Finnfund grants medium and long-term investment loans to finance start-up companies, and acquisitions and expansions of established companies. Financing with mezzanine instruments comprises unsecured subordinated loans, preferred shares and convertible bonds. Finnfund's financing is not tied to Finnish exports but the project should involve a Finnish interest.

8. FRANCE

8.1 La Société de Promotion et de Participation Pour la Coopération Economique (PROPARCO)

PROPARCO, which is a part of the French Agency for Development (AFD), finances private sector development in emerging economies and developing countries, promotes partnerships between companies in the most developed countries and local companies, with emphasis on transfer of know-how and expertise.

PROPARCO investments are always in minority shareholdings and long-term loans of different types. PROPARCO provides guarantees of liquidity and helps mobilize local resources by private sector operators. PROPARCO clients have access to several other instruments such as: the guarantee fund for private investment in member countries of the Economic Community of West African States; the Fund for the Preparation of Private Projects intended to finance part of the cost of pre-investment studies, whether the creation, development, diversification, rehabilitation of private manufacturing or service companies; enterprise scholarships granted by the Ministry of Foreign Affairs to encourage training within companies; and specific funds managed on behalf of the European Union. PROPARCO also offers legal and financial appraisal of the project, advice on legal and financial instruments for company mergers or acquisitions, and arrangement of additional resources.

8.2 Institute of Research for Development (IRD)

The Institute of Research for Development is a French public science and technology research institute under the joint authority of the French ministries in charge of research and overseas development. It has three main missions: research, consultancy and training. It conducts research in Africa, Latin America, Asia and the Pacific in liaison with French higher education and research institutions and with partners in the South - 36 per cent of the Institute's staff works overseas and 600 of its technical staff are from the countries of the South.

The IRD is an active participant in operations supported by the European Union and in many international scientific programmes.

IRD conducts scientific programmes contributing to the sustainable development of developing countries, with an emphasis on the relationship between man and the environment. Its scientific activities are organized through five departments: earth and environment; living resources; societies and health; expertise and consulting; and support and training.

8.3 French Global Environment Facility (FGEF)

The Fonde Français pour l'Environnement Mondiale, or French Global Environment Facility (FGEF), encourages the inclusion of measures to protect the global environment in development projects. It subsidizes projects that protect the environment. Projects must have a beneficial impact on at least one of the following: greenhouse effect; biodiversity; international waters; and ozone layer. It gives priority to creating a demonstration effect through innovative projects.

FGEF provides resources in the form of grants to investment projects with a beneficial impact in terms of the global environment. These resources are intended to cover the additional costs arising out of measures taken to protect the global environment.

8.4 CIRAD (Centre de coopération internationale en recherche agronomique pour le développement)

CIRAD specializes in agricultural research for the tropic and subtropics as a way of contributing to rural development in the countries of these regions. It conducts research, development and training activities and disseminates scientific and technical information. Its work covers agriculture, veterinary, forestry, and food sciences. Its research centres are located in France and in several French overseas territories.

The Centre provide new and emerging technologies related to sustainable agricultural development and conservation of the environment to countries in Africa, Asia, the Pacific, Latin America and Europe. Further, its researchers are posted in 50 countries working with national research organizations or providing technical support in development projects.

9. GERMANY

9.1 Gesellschaft für Technische Zusammenarbeit (GTZ) Public Private Partnerships

The Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ), the German Federal Ministry for Economic Cooperation and Development (BMZ) and the German Investment and Development Company (DEG) have joined efforts to promote technology transfer to developing countries under the programme Public Private Partnerships (PPP).

The private sector creates jobs, trains local personnel and transfers know-how and technology. However, private companies, especially SMEs, frequently find themselves unable to compete on the international stage and often lack the skills and the local contacts. This is where the PPP programme becomes important in effectively and efficiently meeting the objective of both public and private good. GTZ has the relevant experience in human resources development, transfer of agricultural expertise, vocational training, environmental and social standards, technology transfer, financial services, infrastructure, and social initiatives/services that complement the private sector needs.

The PPP programme is open to all German and European firms as well as their affiliates in developing countries, independent of size or business sector.

To promote the cooperation of the private sector and development-policy institutions, the BMZ may contribute up to €200,000 or even more in exceptional cases to projects of one to three years. The projects are jointly planned, financed, and implemented. GTZ supports only the aspects of the projects that go beyond the core business of the firm.

The contributions of the partners must complement each other to ensure success quickly and efficiently. The private partner must make at least 50 per cent of the project costs. GTZ may act as advisor, intermediary, project manager, and specialist. It has permanent offices in Africa, Asia, Latin America, and Eastern Europe with staff in over 120 countries with contacts to partner-country governments, trade associations, and business.

Box 2. Peruvian coffee

Peruvian coffee is penalized with a price reduction on world markets because the country lacks generally recognized quality standards. Therefore, Jacobs Coffee in Bremen has started a project in partnership with the Peruvian Chamber of Coffee in order to bind guaranties of quality and create a national pricing system graded according to quality. The project will increase producers' awareness of quality distinctions, helping them improve income and reputation. GTZ, together with BMZ and the PPP programme have promoted this project from April 2000 with over DM 342,000, while Jacobs Coffee has contributed with over DM400,000.

Source: GTZ.

10. ICELAND

10.1 Icelandic International Development Agency (ICEIDA)

The Icelandic International Development Agency (ICEIDA) promotes cooperation between Iceland and developing countries in improving their economy and the transfer of knowledge and professional skills. The Icelandic Business Development Programme (IBDP) promotes increased relations between Icelandic businesses and firms in developing countries. The programme is aimed at Icelandic companies seeking to form partnerships/joint ventures with companies in the developing countries. IBDP also facilitate the introduction of companies from developing countries seeking to license technology, access new markets, form partnerships/joint ventures, or access complementary expertise from Icelandic businesses. The programme will also help with follow-up contacts and arrangements by organizing forums and private meetings.

Furthermore, the New Business Venture Fund operates an Export Credit Guarantee Department that provides guarantees for projects undertaken by Icelandic companies, both in Iceland and abroad. The Department's function is to guarantee export-related loans, accounts receivable, services, investments, and equipment.

ICEIDA activities are bilateral and are carried out on the basis of a special agreement between the donor country and the recipient country. It can commission official Icelandic institutions, non-governmental organizations or private companies to implement independent projects, which ICEIDA selects and prepares, and then monitors. It can furthermore cooperate with private companies in the developing country. Presently, ICEIDA is engaged in development cooperation with four countries in Africa (Malawi, Mozambique, Namibia and Uganda).

Box 3. Fisheries in Malawi

ICEIDA cooperation with Malawi dating back to 1989 primarily focused on the development of the fisheries sector. Through an agreement between Malawi and Iceland, ICEIDA has provided technical and financial support in developing fisheries research for management of a sustainable fishery on Lake Malawi. This includes placing an Icelandic fisheries biologist in the country's main fisheries research station in Monkey Bay, the operation of the Icelandic funded research vessel R/V Ndunduma and the coordination of the Inland Fisheries Sector in the Southern African Development Community, or SADC.

The aim of the cooperation is to assist Malawi to carry out its coordination function in the Inland Fisheries Sector by establishing a sustainable and functional unit within the Malawi Fisheries Department. ICEIDA's provides financial contributions, fisheries adviser and an information adviser to the Inland Fisheries Sector Technical Co-ordination Unit (IFSTCU) in Lilongwe.

Source: ICEIDA.

11. IRELAND

11.1 Enterprise Ireland

Enterprise Ireland is the government organization charged with assisting the development of Irish enterprises. Its Technology Partnership Programme targets Irish companies seeking to license technology or form partnerships/joint ventures with overseas companies, and overseas companies seeking to license technology, access new markets, form partnerships/joint ventures, share R&D risks, access complementary expertise, and access an established EU sales network, among others.

It also helps companies access Enterprise Ireland's solutions to other business needs that may arise - technical, commercial, intellectual property, legal, financial and marketing skills. Technology Transfer/Business Partnerships Programme help Irish and overseas technology companies to develop mutually profitable business alliances. Successful partnerships have included joint ventures, licensing of products and processes, collaborative research and development, contract manufacturing or "linkage", and distribution and marketing agreements.

Since it began to operate in 1998, Enterprise Ireland's has helped to form over 300 partnerships worldwide. Around 40 new partnership/joint venture agreements are signed each year. It invites participation from a wide range of sectors, including information and communication technologies, software, electronics, engineering, biotechnology, healthcare and food.

12. ITALY

12.1 La Società Italiana per le Impresse all'Éstero (SIMEST)

La Società Italiana per le Imprese all'Estero (SIMEST) is the Italian financial institution for development and promotion of Italian business abroad. SIMEST provides Italian companies seeking to expand abroad technical assistance and advisory services, such as scouting, matchmaking, pre-feasibility and feasibility studies, and advice on financial, legal and corporate investment. It may offer its services in any country except inside the EU, and the projects must include an Italian partner. Its projects concerning developing countries and economies in transition have been carried out in Eastern Europe, sub-Saharan Africa, Latin America, Asia and the Middle East.

SIMEST provides the following instruments: buys shares worth up to 25 per cent of the capital stock of foreign companies, whether Italian-controlled or joint ventures; assumes quotas of foreign investments made by Italian-controlled EU companies; finances foreign shareholdings, or forms financing pools with the merchant bank and/or multilateral finance institution; buys shares in Italian or foreign companies in sectors such as financing, insurance, leasing and manufacturing; assists and advises on investing abroad; and facilitates access to international and supra-national financing and to EU business internationalization programmes.

In addition, it manages funds on behalf of the Italian State designated to support exports credit loans, foreign investments; market penetration; participation in international

tenders; and pre-feasibility and feasibility studies, technical assistance programmes in non-EU countries. Financing of pre-feasibility studies covers up to 50 per cent of the outside estimate, while financing of feasibility studies and technical assistance programmes covers up to 100 per cent of the outside estimate.

13. JAPAN

13.1 Japanese External Trade Organization (JETRO)

In 1994, the Japanese External Trade Organization (JETRO) initiated an industry support project called Supporting Industries Project (SI) to help developing countries. It supports enterprises in developing countries to become efficient suppliers for assembly industries such as automobile, and electronic and electrical industries. The rapid growth experienced in ASEAN and other developing countries has been accompanied by rapid expansion of demand for parts and materials. However, due to lack of local suppliers, many of these parts need to be imported, resulting in increasing trade deficits in those countries. In order to promote direct investment by Japan's own industries, the SI project has been conducting surveys on the current conditions and the investment environment of supporting industries in the developing host countries. The SI project is presently active in six host countries: China, India, Indonesia, Malaysia, the Philippines and Thailand.

JETRO experts are dispatched to assess local plants in supporting industries and to hold technical seminars and consultation sessions for improvement in those industries. The personnel from enterprises in supporting industries in developing host countries are also provided training in Japan.

13.2 Japan International Training Organization (JITCO)

JITCO, established under the joint jurisdiction of five Japanese government ministries: Justice; Foreign Affairs; Economy, Trade and Industry; Health, Labour and Welfare; Land, Infrastructure and Transport in 1991, is instrumental in inviting foreign workers to undergo training at Japanese companies. The goal is to transfer technology to developing countries.

JITCO helps identify Japanese firms that can provide training and matching them with the needs of trainees. The training is provided for a period of one year, where the trainee spends about one-third of the time on off-the-job and two-thirds on on-the-job training. In the event of Technical Intern Training Programme, the trainee my have an extra year to master the technology, skills and knowledge used in the industry of interest. JITCO does not accept interns but promotes the training of overseas trainees in private firms in Japan and helps in provision of information and recommends suitable foreign nationals to the Minister of Justice.

13.3 Japan International Development Organization (JAIDO)

The Japan International Development Organization, Ltd. (JAIDO) is entrusted with the task of promoting foreign currency-generating projects in developing countries in which private Japanese and local enterprises could jointly invest. It helps in financing private joint venture projects between Japanese and local enterprises that contribute to the economic

development of developing countries. In cooperation with the Japanese Government and other concerned parties, it also assists in organizing large scale, long-term projects having environmental or social value. JAIDO has provided assistance for several such projects in Asia, Eastern Europe, Central and South America and Africa.

JAIDO's main function is equity participation and provision of loan facilities. Its investment in a single project varies from ¥10 million to ¥100 million (approx. $86,000-$860,000). The new company should use proven technology. The project is preferably export-oriented or of an import-substitution type. The project should create employment in the host country and deploy environmentally sound practices.

13.4 Japan International Cooperation Agency (JICA)

Japan International Cooperation Agency (JICA) is responsible for technical cooperation aspects of Japan's official development assistance. Technical cooperation is aimed at transfer of technology and knowledge that can serve the socio-economic development of the developing countries. These include training of administrators, technicians and researchers; youth invitation programme; dispatch of technical cooperation experts; project-type technical cooperation; development studies; grant aid to developing countries' governments; and Japan overseas cooperation volunteers (JOCV) programme.

Box 4. Skill Development Institute in Thailand

JICA implemented a five-year project, starting in 1989, to create the Ubon Institute for Skill Development (UBIST) in northeastern Thailand together with the local Ministry of Labour and Social Welfare. JICA provided grants, advisors, management, technical assistance, and equipment, helped design the training programmes and train instructors. JICA's contribution to the project totalled ¥2.386 billion.[27] The centre provides pre-employment, skill improvement and mobile training services. This initiative has rendered good economic and social improvements for the region. The graduates now have greater opportunities for employment in high-paying jobs or for starting their own business.

Source: JICA.

The projects can be classified into four main types: recruitment of experts in accordance with individual requests from developing countries; research cooperation and support for important policies combining group dispatch of experts, acceptance of training participants, and equipment supply; dispatch of personnel from developing countries as experts to other developing countries with the aims of transferring technology that meets the needs of individual developing regions and of promoting South-South cooperation (third-country expert dispatch); and offer-type projects involving suggestions made by Japan to other countries about essential forms of cooperation (JICA Partnership Programme, Private Sector Proposal-type Intellectual Assistance Seminars, public participation experts etc.).

[27] http://www.jica.go.jp/english/publication/studyreport/topical/impact/ubon.pdf

14. NETHERLANDS

14.1 Nederlandse Financierings-Maatschappij voor Ontwikkelingslanden (FMO)

The Netherlands Development Finance Company (FMO), a joint initiative between the Netherlands Government and Dutch financial institutions, industry and trade unions, is the Dutch development bank supporting businesses and financial institutions in developing countries and emerging markets with capital and know-how.

FMO Finance provides risk finance to enterprises investing in developing countries, manages special funds focusing on local small and medium-sized enterprises and takes the lead in investments in more high-risk countries and sectors. FMO Investment Promotion provides subsidies for capital goods export transactions and technical assistance, facilitating non-commercially viable activities as a way of catalyzing private sector activity.

FMO also managers various Dutch Government programmes:

- Development-related export transactions programme (ORET/MILIEV): awards grants to developing countries for buying capital goods, services and works from Dutch enterprises.

- Investment Promotion and Technical Assistance to Developing Countries (IPTA-DC): provides grants for feasibility studies, temporary management and technical assistance, and job related training and education, among others.

- Technical Assistance in Emerging Markets (TAEM): promotes investments by Dutch SMEs by subsidizing knowledge transfer activities supporting an investment, such as temporary management and education, for Dutch SMEs located in Sub-Saharan Africa, Asia, Latin America, and Eastern Europe.

FMO manages the following special funds, among others:

- **Investment Facility Emerging Markets (IFOM)** to stimulate the investment of Dutch SMEs in these markets by providing subordinated loans.

- **Netherlands Investment Matching Facility (NIMF)** provides both long-term risk capital and specific sector expertise.

- **Infrastructure Fund for Least Developed Countries** supports the development and improvement of social-economic infrastructure in LDCs. The fund provides risk capital to catalyzing additional private funds for investment in private or public-private infrastructure projects in these countries.

- **Financial Sector Development Fund** contributes to the improvement of financial services for small businesses, micro entrepreneurs and lower

income groups. FMO concentrates on strengthening the financial intermediaries who target these groups in the market.

At the end of 2003, FMO's investment portfolio amounted to €1.9 billion of which 77 per cent was in countries with low and low-medium levels of income. A little over 40 per cent of its portfolio is made up of projects in the financial sector. Other focus sectors are infrastructure, telecommunications, energy, water, export industry and trade.

14.2 Ministry of Economic Affaires (MINEZ)

The Dutch Ministry of Economic Affaires (MINEZ) controls a number of agencies that help and advise Dutch and foreign companies on a range of economic subjects. Senter International is one such agency. Senter offers subsidies and credits to Dutch companies, especially SMEs, operating on an international scale. These include schemes and programmes for export promotion, foreign investment and international economic collaboration.

Senter manages:

- PSO: The Programme for Cooperation with Central and Eastern Europe to transfer economic knowledge from the Dutch business community to the region through investments. Its primary goal is to position Dutch companies in the developing markets by funding projects that are assigned to Dutch companies to transfer knowledge and expertise.

- PSOM: the Cooperation Programme with Emerging Markets (PSOM) offers companies a stepping-stone to a more structural commercial presence in these countries. Dutch companies are invited through a public tender procedure to submit proposals for projects in sectors identified in consultation with developing countries. This programme is aimed at stimulating investments and commercial cooperation between Dutch companies and companies in China, Cuba, Egypt, Ghana, Indonesia, Mozambique, Thailand, Uganda, South Africa and Tanzania.

Box 5. Safflower oil production in Tanzania

Senter is involved in a project for the establishment of a safflower oil production plant and production of safflower by farmers in the Arusha region, Northern Tanzania. The project's aims include the development of a safflower oil extraction plant with a capacity of 1,000 tons per year. Therefore, personnel training, dissemination and marketing, as well as experiments with new safflower varieties containing high oil content will be the main activities conducted. Local farmers in the region will benefit from production orders of more than 4,000 hectares of safflower and they will receive technical assistance in order to meet production standards. Up to 80 per cent of the safflower is planned to be produced pesticide free and will be exported to Europe, the United States and Japan and is expected to meet internationally acknowledged certifying organization standards. Participants include Quality Food Ltd., DLV Agriconsult, and Pop Vriend Seeds BV as the Dutch investor.

Source: Senter.

Another MINEZ's agency is the Netherlands Foreign Trade Agency (EVD) that informs Dutch SMEs about business opportunities to be found outside the Netherlands and finds foreign partners for Dutch companies and helps to establish contact with European Union's programmes like Asia Invest and with other institutions such as the FMO.

Senter's specific programmes stimulate FDI by the provision of funds, and knowledge transfer. They provide or fund training courses, feasibility studies and market research, temporary management and technical assistance projects, and job-specific training and education.

15. NEW ZEALAND

15.1 New Zealand Overseas Development Assistance (NZODA)

New Zealand's Overseas Development Assistance (NZODA) is delivered by the New Zealand's Agency for International Development (NZAID), a part of the Ministry of Foreign Affairs (MFAT). It manages the Asia Development Assistance Facility programme (ADAF) and the Latin America Development Assistance Facility (LADAF) as well as similar facilities for Africa, which support initiatives that are outside the usual bilateral relationships with governments. The objective of ADAF is "to contribute to a reduction of poverty in Asia by fostering private and institutional partnerships that respond to local development needs and initiatives and build local capacity and self-reliance". As a part of this initiative, NZODA supports New Zealand firms in studying and analysing investment prospects in developing countries to facilitate private investment.

ADAF finances up to 75 per cent of the cost of preliminary studies (max. NZD 500 000). It also provides short-term training and technical assistance. NZODA's primary prerequisite is that the activity must address the issue of reduction of poverty in the partner country. Additionally, the New Zealand partner must demonstrate both a commitment to development in Asia and that it has the appropriate expertise for the proposed task. The projects must also have an element of capacity building for the recipient country partner. NZAID also organizes seminars and publishes documents to disseminate information on its programmes.

16. NORDIC COUNTRIES

16.1 Nordic-Southern African Development (NORSAD)

NORSAD is a joint Nordic/Southern African Development Community (SADC) initiative that supports economic and industrial development by promoting and financing sound businesses in the SADC region. The agency is the manager of the NORSAD Fund with a capital of DKK 350 million, (approx. **€**46 million) donated by the four Nordic (Scandinavian) Governments. It provides loans and matchmaking services for projects and business advisory services for companies in the SADC countries. It recommends commercially viable equity-based joint venture project proposals from promoters in those countries to interested partners in the Nordic countries and facilitates the transfer of suitable Nordic technology to SADC private sector enterprises. Non-equity partnerships involving technology transfer are also eligible for NORSAD financing under certain circumstances.

NORSAD is able to finance any project located in a SADC member country that is technically feasible and economically viable without subsidies and undue protection. Equity or quasi-equity instruments provided by the project promoters and other investors must cover 40 per cent of the total cost of the project. The project has to have a positive impact on the host country and meet international environmental standards.

Loans and guarantees are used for both capital investments and working capital. The interest rate is fixed and ranges from 7 to 10 per cent a year. A commitment fee of 1 per cent is payable upon signing the loan agreement. Redemption on a quarterly basis may include a grace period of not more than two years. NORSAD's finance should normally not exceed 50 per cent of the total project cost or €2 million. Guarantees in foreign currency to other finance institutions for loans and credit may be granted for a maximum period of seven years.

It requires suitable securities for any loans, including bank guarantees, foreign sponsor guarantees, fixed and floating charges on assets and escrow accounts.

Loans are NORSAD's main financing method, but it is now introducing equity investments. Its funds are untied and may be used for the import of machinery, equipment, raw materials or know-how.

17. NORWAY

17.1 Norwegian Agency for Development Cooperation (Norad)

The Norwegian Agency for Development Cooperation (Norad) was created to assist developing countries in their efforts to achieve lasting improvements in economic and social conditions for the entire population within the limits imposed by the natural environment and the natural resource base. Partners in cooperation and beneficiaries of development cooperation are primarily the central government and local authorities, the civil society, and the business sector. Promotions of investment and trade projects are given assistance in order to stimulate transfer of capital and technology to support infrastructure and industrial development. For this purpose, a series of financial facilities have been established. Norad provides aid in Asia, Africa and Central America.

Norad provides support for feasibility studies, environment protection, product development, marketing and export promotion of goods from developing countries, training of employees, and temporary management assistance. In order to be eligible for aid, a project is expected to be commercially viable and contribute to a sound economic and social development in the host country. Some parameters taken into consideration are: that the investment must enhance the professional skills of the local work force; contribute towards raising the level of technology in the host country; contribute towards improvement of the host country's balance of payment through increased export or viable substitution of imports, and comply with international standards for environmental protection.

17.2 Matchmaking Programmes (MMP)

Under its strategy for private sector development in the South, Norad's Matchmaking Programmes (MMP) helps establish sustainable and profitable joint ventures between

Norwegian companies and companies in India, South Africa and Sri Lanka. MMP may be directed either at establishing a joint venture between two business partners or developing linkages with suppliers in the host country. The aims of this programme are to promote technology transfer and the exchange of management and business skills between South African/Sri Lanka/Indian and Norwegian companies.

Norad offers financial support in the start-up phase of the investment. It funds up to 50 per cent of the costs of feasibility studies and consultancy assistance. It provides grants for covering up to 50 per cent of the costs for training of local employees. Costs associated with investments in environmental protection may receive a grant of up to 80 per cent. Travel expenses for the partners to visit each other are also covered. The involvement of partners must be long-term and they must have the intention of being active owners/partners and be prepared to take risks in the project. Pure export/import-projects are excluded. Norad demands participants to have the necessary resources for international collaboration, i.e. technical competence, management capacity/skills as well as financial resources. The home companies shall normally have been in operation for more than three years.

17.3 Norwegian Investment Fund for Developing Countries (NORFUND)

The Norwegian Investment Fund for Developing Countries (NORFUND) makes risk capital investments through profitable private enterprises in Africa, Asia, Latin America and the Balkans. Countries with GDP under $5,295 per capita are eligible for investments. It provides equity and debt financing for new business ventures, expansions, management buy-ins and buy-outs, and can invest in most sectors of the economy as long as the investment offers opportunities for growth, profitability and local development.

The main objective of NORFUND's activities is to address the lack of private risk capital in developing countries. Therefore, NORFUND concentrates primarily on equity capital for direct investment and investments in local investment funds. It also uses other financial instruments to the degree that is desirable and necessary in order to facilitate the transaction.

NORFUND not only provides capital but also expertise for the establishment of commercial enterprises in developing countries. NORFUND shares the risk and the profits of its partners and plays a professional role, actively contributing to the success of the projects in which it is involved.

Box 6. Bosnian fishery

Norfish Blagaj, a fish farming company in Mostar, Bosnia, is specializing in hatching and growing trout. In 2000, NORFUND acquired 70 per cent of the company together with the Norwegian Balkan Invest AS, a Norwegian group of experienced fish farmers. By bringing in the latest technology and methods for running a fish farm the plan is to increase productivity and profits substantially. In January 2002, the plant opened a processing and packaging facility. With a capacity of close to 20 tons a day, the company is now able to offer processed products and transport fresh fish over long distances.

Source: NORFUND.

18. PORTUGAL

18.1 Investment, Trade and Tourism of Portugal (ICEP)

ICEP Portugal is an autonomous agency of the Ministry of Economy promoting Portugal as an attractive location for investment and tourism as well as export of Portuguese goods and services. Its task is to foster economic links and promote the international image of Portugal. ICEP also supports internationalization of Portuguese enterprises by providing incentives that include: tax exemptions and tax credit; credit insurance to cover commercial and political risks; support for procurement design and management; and subsidies. The Fund for the Internationalization of Portuguese Enterprises (FIEP) provides equity investment and equity loans.

Among ICEP's support instruments are IPAD, the Portuguese Development Support Institute; COSAC, a Credit Insurance Company; IAPMEI, the Institute for Supporting Small and Medium Enterprises and Investment; and IPE CAPITAL, a Risk Capital Company.

The Portuguese Development Support Institute (IPAD), an agency of the Ministry of Foreign Affairs, was created in 2003 to coordinate the Portuguese aid programme and carry out policy reviews and evaluations. IPAD also promotes Portuguese investment, provides support towards social and economic infrastructure projects and the development of the private sector in host countries. The priority areas of Portuguese development cooperation are agriculture, education, health, infrastructure and private sector development.

19. SPAIN

19.1 Company of Development Financing (COFIDES)

The Spanish Company of Development Financing, COFIDES, promotes direct investments by the Spanish enterprises willing to contribute risk capital, technology, management resources, and long-term commitment to projects in developing countries. The main goal is to promote the economic development of host countries and the internationalization of Spanish businesses. COFIDES has its own funds and is able to mobilize resources to support any private project involving a Spanish company in any developing country or transition economy in Africa, Asia, Central and Eastern Europe and Latin America.

COFIDES provides financial support for investments through minority and temporary capital share holdings, but such support should not exceed that contributed by the Spanish partner. COFIDES also provides consultancy and helps in obtaining financing from other financial institutions or programmes that could provide subsidies for feasibility studies as well as training, technical and management assistance.

20. SWEDEN

20.1 Swedish International Development Cooperation Agency (Sida)

The Swedish International Development Cooperation Agency (SIDA) is the Swedish Government agency for bilateral international development assistance. SIDA supports

development of the institutional framework, private sector development, small and medium size enterprises, establishment of efficient financial markets, infrastructure development, trade related projects, human resource development and training for business people, and promotes alliances between companies in Sweden and the partner country.

20.2 SWEDFUND International

SWEDFUND International offers risk capital and know-how to Swedish companies investing in Africa, Latin America, Asia, and Eastern Europe. Risk capital is invested in companies with well-defined business concepts and with a strong growth potential. The returns from these investments are then reinvested in new profitable companies. With the exception of the LDCs, a Swedish interest is required as a strategic partner, normally a Swedish company.

SWEDFUND invests in any developing country, with a focus on countries with a per capita GNP of less than $3,000 per year. It also invests in Eastern European countries with the exception of the countries that are members of the European Union. Investments may be made in most industries with the exception of companies that manufacture or distribute weapons, tobacco and alcohol.

SWEDFUND may provide up to 30 per cent of the total capital required but not seed capital and the Swedish partner should have at least a three-year track record and international business experience.

SWEDFUND provides venture capital, generally in the form of equity, to local companies in one or several countries or together with other international or local financial institutions and companies. Its financial solutions comprise ordinary and preference shares, leasing, loan guarantees, and participating, subordinated or secured loans. When the venture has achieved a sustainable and profitable operation with views to the long term, SWEDFUND will sell its shares to the other investors or any willing buyer.

Box 7. Lithuanian dairy production

LRF's (Federation of Swedish Farmers) venture capital company SwedeAgri Invest and Swedfund have invested SEK 100 million in the Lithuanian diary group Pieno Zwaigzdes (PZ). LRF and Swedfund together own one third of the shares in the company. Swedfund invested SEK 25 million. Swedfund's role is to share the risk and be a financer of a company that needs financial resources to restructure its business and increase its competition and profit.

Through the investment, Swedfund and SwedeAgri take part in creating a market leader on fresh dairy products in Lithuania. Thanks to the added capital, PZ can contribute to the re-structuring of the diary industry in the country, which is necessary in order to manage the international competition in the future. The project also leads to transfer of knowledge from Sweden to Lithuania. Education of the diary farmers is emphasized in order to improve the hygiene and to receive a higher quality and better efficiency on the farms. Due to projects like these, Lithuania, the largest farmland in the Baltic region, opens up to opportunities for Swedish food companies.

Source: Swedfund.

21. SWITZERLAND

21.1 Swiss State Secretariat for Economic Affairs (SECO) – Swiss Development Finance Corporation (SDFC)

The Swiss State Secretariat for Economic Affairs (SECO) and institutional investors have launched the Swiss Development Finance Corporation (SDFC), a private company that promotes private direct investment in developing countries and transitional economies over the long term, mainly in projects that are export-driven and are SMEs. SDFC's provides credit facilities and equity financing, and through syndication of additional debt financing by other financial institutions. SDFC investors expect profits commensurate with the risks they accept.

SECO mobilizes private sector resources to increase the flow of finance and transfer of technology, know-how and management skills to the developing countries and improve the host's productive and social infrastructure to achieve greater integration into international markets.

The Corporation provides mezzanine or equity portion of the financing package and financial consultancy and grants varying between 35 and 50 per cent, depending on the development status of the recipient country and the characteristics of the project concerned. SDFC also offers management services, among others. Project credits may be granted in countries with a per capita income of less than $3,035.

21.2 Swiss Organization for Facilitating Investments (SOFI)

The Swiss Organisation for Facilitating Investments (SOFI) was created in 1997 on the initiative of the Swiss State Secretariat for Economic Affairs (SECO) in cooperation with KPMG. SOFI promotes investment projects between Swiss SMEs and counterparts in developing countries and transition economies and to enable the transfer of capital, technology and managerial skills in the process. Currently, it has agreements with about 80 countries in Africa, the Middle East, Latin America, Asia and Eastern and Central Europe.

SOFI is a one-stop shop providing SMEs the full range of services, from the inception of an investment idea to the successful implementation of an investment project.

SOFI organizes conferences and missions; identifies business opportunities, provides information, conducts partner searches and offers consulting services. SOFI also manages the SECO's Start-up Fund (SSF) that offers loans to support Swiss companies in the start-up phase of their operations. The fund can cover up to 50 per cent of the project costs.

22. UNITED KINGDOM

22.1 CDC Capital Partners

CDC Capital Partners, formerly known as the Commonwealth Development Corporation, provides equity capital for commercially sustainable business ventures in emerging markets. It targets a wide range of businesses in Latin America, Africa, South Asia and Asia Pacific.

It provides risk capital for investment and arranges the necessary funding; assists in negotiations and works with the management team to develop the business. Additionally, it provides in-depth understanding of how developing economies work. It has on-the-ground presence and sector specialists across developing and developed countries, and promotes linkages through contact information in its databases. It also offers appreciation of risk and risk mitigation analyses, facilitation of dealings with governments and other regulatory offices, and introduction of co-investors.

22.2 Department for International Development (DFID)

The UK Department for International Development (DFID) is a UK Government department, working to promote sustainable development and eliminate world poverty. DFID operates a number of different funding schemes, including the following:

Business Linkages Challenge Fund (BLCF)

This fund is open to any registered private sector enterprise, as well as to business and civil-society organizations in the UK and selected countries in Africa and the Caribbean. BLCF makes grants for the development of business linkages that improve competitiveness and benefit the poor. Grants are allocated on a competitive basis to ensure that public funds are used to best effect. Projects should demonstrate real innovation and help the poor. Approved linkages will mobilize enterprises and their representatives by transferring skills, information and technology, improving sourcing, product supply and market access.

Financial Deepening Challenge Fund (FDCF)

FDCF encourages and supports banks and other commercial financial institutions registered in selected countries across Africa, Asia or the UK to develop innovative and sustainable financial products and services that benefit the poor. The fund aims to contribute to developing strong financial services sectors that allow the poor, and enterprises owned by or employing the poor, to access financial services. The FDCF supports projects involving the development and piloting of a broad range of innovative financial services (e.g. in credit, savings, insurance, health cover, mortgages, pensions, leasing, working capital and remittances), and improvements to the regulatory and supervisory environment.

The Challenge Funds grants in the BLCF and FDCF are cost-sharing contributions that do not exceed the amount invested by the private partners, and with a maximum value of £1,000,000. Bidders' contributions are necessary to demonstrate their commitment and belief in the viability and sustainability of the project. The BLCF has a specific window to co-fund proposals by business consortia that aim at improving the enabling environment for private sector development. The FDCF has committed its full allocation of funds and is no longer open for new grants.

Technology Partnership Initiative (TPI)

The Joint Environmental Markets Unit (JEMU) is a UK government unit with responsibility for promoting and supporting the national environmental industry. JEMU manages the Technology Partnership Initiative (TPI) aimed at linking companies and organizations in industrializing and developing countries with UK companies and other

organizations, which provide technologies and services, as well as information and advice needed to deal with environmental problems. This is done through international partnerships.

Through a quarterly newsletter (TPI News), information on new technologies and case studies in each issue are made available to members. News and features cover environmental events, trade missions and international visits. In collaboration with local organizations and in partnership with the UK companies, TPI arranges training seminars, to bring senior businessmen and women to the UK to acquire practical experience of modern technology, management and production methods in use.

A database of UK suppliers is available on the JEMU website with UK environmental companies, trade bodies, training and development and demonstration sites to match potential business associates with overseas companies. The UK companies may offer a broad range of technologies, skills and expertise.

Box 8. Traditional agriculture in the Himalayas

Grain milling is already the most widespread use of hydropower in the Himalayas. Traditional wooden watermills (gharats) have been used for hundreds of years, but are crude and inefficient and are now falling into disuse. Other essential crop processing needs in the region include rice hulling and oil expelling tasks currently undertaken with laborious manual methods by the village women, or by carrying produce long distances to diesel or electric mills. DFID funded a 20-month project managed by IT Power to provide technical assistance in developing sustainable new agro-processing schemes and disseminating the technology more widely. A five-day training programme was carried out from 10-14 December 2001 for watermillers, fabricators, engineering diploma students and rural development NGOs, with sponsorship from Engineers Against Poverty. The training was aimed at building capacity among watermiller communities to operate and maintain the new waterpower systems.

With the basic gharat upgrade, the millers can grind much more wheat and save a lot on energy thus increasing their income. Their earnings are also nearly three times that which could be earned using the same power to generate electricity, but at a fraction of the investment cost. Over 100 gharat upgrades are now in use. The cross-flow installations expand the use of hydropower for agro-processing and are also efficient energy producers. Two cross flow systems were implemented under the DFID project, each operating a rice-huller and generator, and have been successfully serving their local communities. If the miller can de-husk 200 kg/day for 200 days per year then he will pay back the investment in less than three years.

Source: DFID.

23. UNITED STATES

23.1 US Agency for International Development (USAID) – Global Trade and Technology Network (GTN)

USAID has developed the Global Trade & Technology Network (GTN), a programme that facilitates the formation of business linkages and technology transfer. GTN matches the technological needs of companies in developing countries with technical solutions in the US. The programme disseminates trade leads via e-mail to companies in the US, Latin America, Asia, Africa and Southeast Europe that register with GTN for free.

GTN's e-commerce platform has enabled firms to establish international trade linkages through joint ventures, direct sales or direct purchases, agent/distributorships, licensing, and franchise agreements. Services are available to firms in all industry sectors.

GTN cooperates with other USAID technology transfer programmes, most notably the EcoLinks programme, which facilitates the transfer of US environmental technologies to countries in Eastern Europe and Eurasia.

For example, a major Czech manufacturer of solar collectors and solar thermal systems submitted a Global Trade & Technology Network (GTN) trade lead for innovative solar energy utilization. CS Prague/EcoLinks matched the company through GTN with a US firm. Both firms applied for an EcoLinks Quick Response Award (QRA) grant that was approved in 2001. The $5,000 QRA financed joint initiatives, funded the initial meetings, and paid for the technical review. As the result, the Czech company placed an order for solar energy utilization equipment. The value of this first order was $13,080. The direct follow-up of that matching was a second order placed with the US company's mother company for additional solar energy utilization equipment. The total amount of the Czech company's orders was $103,755.

23.2 USAID-Leland

USAID runs a project called the Leland Initiative whose goal is to establish well-functioning Internet services in over 20 African countries by enabling partners to connect to the Internet and other global information infrastructure (GII) technologies. The project supports policy reforms, facilitates low-cost and high-speed access to the Internet and uses proven mechanisms to build networks of active users. It works with the private and public sectors to build sustainable networks and profitable Internet service providers.

The Leland Initiative provides the infrastructure, hardware and training. In order to join, the USAID country office will have to make a request to Leland Washington. The national telecommunication and Internet policies and status are evaluated through country visits and consultations with national authorities. If a request is approved, a memorandum of understanding is signed and a plan of action developed.

Annex 2

The OECD Guidelines for Multinational Enterprises (2000)

Science and Technology

Enterprises should:

1. Endeavour to ensure that their activities are compatible with the science and technology (S&T) policies and plans of the countries in which they operate and as appropriate contribute to the development of local and national innovative capacity.

2. Adopt, where practicable in the course of their business activities, practices that permit the transfer and rapid diffusion of technologies and know-how, with due regard to the protection of intellectual property rights.

3. When appropriate, perform science and technology development work in host countries to address local market needs, as well as employ host country personnel in an S&T capacity and encourage their training, taking into account commercial needs.

4. When granting licenses for the use of intellectual property rights or when otherwise transferring technology, do so on reasonable terms and conditions and in a manner that contributes to the long term development prospects of the host country.

5. Where relevant to commercial objectives, develop ties with local universities, public research institutions, and participate in co-operative research projects with local industry or industry associations.

Annex 3
DAC list of aid recipients (as of 1 January 2003)

Part I: Developing countries and territories (official development assistance)						**Part II: Countries and territories in transition (official aid)**	
Least developed countries	Other low-income countries (per capita GNI < $745 in 2001)	Lower-middle-income countries (per capita GNI $746-$2 975 in 2001)		Upper-middle-income countries (per capital GNI $2 976- $9 205 in 2001)	High-income countries (per capita GNI > $9 206 in 2001)	Central and Eastern European countries and new independent states of the former Soviet Union	More advanced developing countries and Territories
Afghanistan	*Armenia	Albania	Palestinian territory	Botswana	Bahrain	*Belarus	#Aruba
Angola	*Azerbaijan	Algeria	Paraguay	Brazil		*Bulgaria	Bahamas
Bangladesh	Cameroon	Belize	Peru	Chile		*Czech Republic	#Bermuda
Benin	Congo	Bolivia	Philippines	Cook Islands		*Estonia	Brunei
Bhutan	Côte d'Ivoire	Bosnia and Herzegovina	Serbia & Montenegro	Costa Rica		*Hungary	#Cayman Islands
Burkina Faso	Dem. People's Rep. of Korea	China	South Africa	Croatia		*Latvia	Cyprus
Burundi	*Georgia	Colombia	Sri Lanka	Dominica		*Lithuania	#Falkland Islands
Cambodia	Ghana	Cuba	St Vincent & Grenadines	Gabon		*Poland	#French Polynesia
Cape Verde	India	Dominican Republic	Suriname	Grenada		*Romania	#Gibraltar
Central African Republic	Indonesia	Ecuador	Swaziland	Lebanon		*Russia	#Hong Kong (China)
Chad	Kenya	Egypt	Syria	Malaysia		*Slovak Republic	Israel
Comoros	*Kyrgyzstan	El Salvador	Thailand	Mauritius		*Ukraine	Korea, Rep. of
Congo, Dem. Rep. of the	*Moldova	Fiji	The former Yugoslav Rep. of Macedonia	#Mayotte			Kuwait
Djibouti	Mongolia	Guatemala	#Tokelau	Nauru			Libya
Equatorial Guinea	Nicaragua	Guyana	Tonga	Panama			#Macao
Eritrea	Nigeria	Honduras	Tunisia	#St Helena			Malta
Ethiopia	Pakistan	Iran	Turkey	St Lucia			#Netherlands Antilles
Gambia	Papua New Guinea	Iraq	*Turkmenistan	Venezuela			#New Caledonia
Guinea	*Tajikistan	Jamaica	#Wallis and Futuna	----------			Qatar
Guinea-Bissau	*Uzbekistan	Jordan		**Threshold for World Bank loan eligibility ($5 185 in 2001)**			Singapore
Haiti	Viet Nam	*Kazakhstan		----------			Slovenia
Kiribati	Zimbabwe	Marshall Islands		#Anguilla			Taiwan Rep. of China
Lao People's Dem. Rep.		Micronesia, Fed. States		Antigua and Barbuda			United Arab Emirates
Lesotho		Morocco		Argentina			#Virgin Islands (UK)
Liberia		Namibia		Barbados			
Madagascar		Niue		Mexico			
Malawi				#Montserrat			
Maldives				Oman			
Mali				Palau Islands			
Mauritania				Saudi Arabia			
Mozambique				Seychelles			
Myanmar				St Kitts and Nevis			
Nepal				Trinidad and Tobago			
Niger				#Turks and Caicos Is.			
Rwanda				Uruguay			
Samoa							
Sao Tome and Principe							
Senegal							
Sierra Leone							
Solomon Islands							
Somalia							
Sudan							
Tanzania							
Timor-Leste							
Togo							
Tuvalu							
Uganda							
Vanuatu							
Yemen							
Zambia							

* Central and Eastern European countries and New Independent States of the former Soviet Union.
\# Territories.
Source: OECD, 2003 (http://www.oecd.org/dataoecd/35/9/2488552.pdf).

Annex 4

Websites of agencies, programmes and institutions profiled

Australian Aid Agency
<http://www.ausaid.gov.au/> as of July 2004.

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UNCTAD's Work in the Area of Technology Transfer and Intellectual Property Rights

Responding to the mandate received from member States at the recent Ministerial Conference in São Paolo as well as from the Bangkok Plan of Action, the UNCTAD secretariat is implementing a transfer of technology and intellectual property rights (TOT-IP) work plan under its international arrangements programme (covering issues related to investment, as well as technology and intellectual property). The TOT-IP initiative seeks to help developing countries participate effectively in international discussions on technology transfer and intellectual property, and to identify policy options for successfully integrating developing countries into the world economy. The programme conducts research and policy analysis, technical assistance and policy dialogues with negotiators, diplomats and policy makers.

A. Work in the area of technology transfer

The TOT study series addresses government officials, international organizations and agencies, and researchers. It draws lessons from successful experiences with technology transfer and diffusion in developing countries and the effectiveness of the different modes of technology transfer.

- ***Case studies on TOT in developing countries.*** UNCTAD's series *Transfer of Technology for the Successful Integration in the Global Economy* consists of a number of case studies on TOT issues in individual industries in selected developing countries. These studies draw lessons from successful experiences with the transfer and diffusion of technology through various channels.

- ***Home-country measures in promoting TOT.*** The paper presents an overview of initiatives and measures as well as incentives provided to industry and public institutions in developed countries to facilitate the transfer of technology to developing countries. It covers measures that promote technology transfer through investment, training, matchmaking services, financing and development of the technological absorptive capacity of developing countries.

- ***Compendium of international TOT arrangements.*** To provide an overview of existing technology-related provisions in international instruments, UNCTAD has compiled a "Compendium of International Arrangements on Transfer of Technology: Selected Instruments".[28] This compendium contains a selection of TOT-related provisions drawn from international instruments. It includes relevant excerpts of international instruments at the multilateral, regional, inter-regional and bilateral levels. The technology-related provisions contained in such instruments follow different approaches, depending on the purpose of the respective instruments. They all aim at promoting access to technologies and, in some cases, the development of local capabilities in developing countries, particularly in least developed countries.

[28] UNCTAD (2001) Compendium of international arrangements on transfer of technology: selected instruments, UNCTAD/ITE/IPCMisc.5

- ***Training course on TOT.*** Another activity carried out under the TOT-IP programmerelates to the design of a "Training Course on Issues Related to Technology Transfer" for capital-based policy makers and Geneva-based negotiators, as well as developing country universities. The course modules are currently being finalized.

B. Work in the area of intellectual property rights

The UNCTAD-ICTSD[29] Project on Intellectual Property Rights and Sustainable Development is intended to address the concerns voiced by developing countries with respect to implementation of the TRIPS Agreement and new developments brought to the area of IPRs by multilateral treaties and regional and bilateral free trade agreements.

The project aims at improving the understanding of the development implications of IPRs; and facilitating informed participation in ongoing multilateral, regional and bilateral negotiations as well as assisting national authorities in the implementation and adoption of forward-looking IPRs policies.

The project consists of three interrelated components:

1. Policy-oriented interdisciplinary research. Highlights of the project's research outputs include:

- A *Resource Book on TRIPS and Development* providing a development-oriented analysis of each provision of the TRIPS Agreement, taking into account economic and social implications and IPR trends in non-WTO forums. The entire book is available on the project website (*www.iprsonline.org*) and will be published as a revised version by Cambridge University Press in late 2004.

- *Studies* on various topical IPR issues including transfer of technology, public health, geographical indications, nutrition, traditional knowledge, TRIPS-plus in bilateral and regional agreements, technical assistance, innovation, competition, and computer software.

- *A Policy Discussion Paper*: *Intellectual Property Rights: Implications for Development,* intended to be a synthesis of the main issues to help policy makers, stakeholders and the public in developing and developed countries to understand the development impact of IPRs and different policy positions regarding TRIPS.

2. Enhancing policy formulation. The project places considerable emphasis on assisting developing countries in enhancing IP policy formulation through establishing and supporting networks. The overall objective is to facilitate the emergence of a critical mass of well-informed stakeholders that could play an active role in future policy making.

- *At the international level*, the project has convened a series of dialogues involving key policy makers and stakeholders at the Rockefeller Foundation facilities in Bellagio,

[29] International Centre for Trade and Sustainable Development.

Italy, in order to build and promote a development-oriented agenda on IPRs. The next Bellagio dialogues will be held in October and December 2004.

- *At the regional and national level,* the project works closely with selected centres of excellence based in established universities and research institutions in developing countries, as well as with NGOs, media and parliamentarians. The main means of collaboration are joint research and regional dialogues, which draw, *inter alia*, on the existing and ongoing research described above.

3. Outreach and dissemination. Outreach and dissemination are carried out both though traditional channels and, in particular, through the continuous updating and maintenance of the project website (*www.iprsonline.org*). Regular informal encounters with stakeholders in Geneva are organized to continue raising awareness and to keep Geneva-based delegations properly informed of the project's activities, including the regional dialogues.

Since 2001, the project has benefited from the financial support of the Department for International Development (DFID; UK), the Swedish International Development Cooperation Agency (SIDA) and the Rockefeller Foundation.

Selected UNCTAD Publications on Transfer of Technology and Intellectual Property

These documents can be found on: http://www.unctad.org/publications

Transfer of Technology for Successful Integration into the Global Economy 206 p. Sales No. E.03.II.D.31.

Compendium of International Arrangements on Transfer of Technology : Selected Instruments. 308 p**.** Sales No. E.01.II.D.28. www.unctad.org/en/docs/psiteipcm5.en.pdf

T**ax Incentives and Foreign Direct Investment A Global Survey**. 177 p. Sales No. E. 01.II.D.5

Transfer of Technology for Successful Integration into the Global Economy : A case study of the Pharmaceutical Industry in India. 52 p. UNCTAD/ITE/MISC.22

Transfer of Technology for Successful Integration into the Global Economy : A case study of the South African automotive industry . 34 p. UNCDAT/ITE/IPC/MISC. 21

Transfer of Technology for Successful Integration into the Globa Economy : A case study of Embraer in Brazil 61 p. UNCTAD/ITE/IPC/MISC.20.

Transfer of Technology for Successful Integration into the Global Economy. 206 p. Sales No. E.03.II.D.31

The TRIPS Agreement and Developing Countries. 64 p. Sales No. 96.II.D.10

Protecting Traditional Knowledge and Folklore: A review of progress in diplomacy and policy formulation. Issue Paper No. 1, by Graham Dutfield, 2003.

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Intellectual Property and Computer Software, A Battle of Competing Use and Access Visions for Countries of the South. Issue Paper No. 10, by Alan Story, 2004.