ECONOMIC AND TECHNICAL COOPERATION: CREATING THE ENVIRONMENT TO REMOVE THE BARRIERS

ZHOU XIAOBING & ZHAO JIANGLIN

With the ongoing process of economic integration in the Asia Pacific region, APEC members have made many positive contributions to realising sustainable economic development in the region. However, integration has failed to narrow the gaps in economic development among members. Indeed, the disparity has widened in some respects. Enhancing technical cooperation and improving the capacity for technical renewal is one means of promoting sustainable development in the region. In the words of the Eminent Persons Group (EPG), the flow of new and high technology accelerates economic development and enhances scientific and technological capability, promotes trade and investment liberalisation and reduces disparities in the level of economic development.

PROGRESS IN APEC ECONOMIC AND TECHNICAL COOPERATION

Economic and technical cooperation helps speed the pace of trade and investment liberalisation and facilitation (TILF). A common understanding has been reached among APEC members that economic and technical cooperation and TILF are complementary wheels driving the development of APEC. Any activity in economic and technical cooperation among APEC members is certain to have a positive impact—direct or indirect—on TILF. Such cooperation also helps promote long-term sustainable development in the Asia Pacific region.

The capability of APEC members for technical progress is of key importance to sustainable development in the Asia Pacific region, and technical cooperation among members is an integral part of this process. Developing members need to enhance technical cooperation with developed members to meet the increasing demand for high technology products because improving the knowledge and technology components of economic growth not only promotes sustainable development in their own economies but also helps promote efficiency of resource

allocation in the entire Asia Pacific region. Promoting technology transfer to developing members and helping them develop their economies is also in the interests of developed members because economic development among developing members will provide larger markets for developed members. In the meantime, technology transfer to developing members presents an opportunity to enhance the profit-earning capacity of developed members because the transfer also helps them to speed the pace of technological development. Technical progress among APEC members spurs economic growth—particularly of developing members—and helps improve the efficiency of resource allocation in the region. Moreover, some technical cooperation projects—in fields such as environmental protection, industrial production and agricultural production—directly promote sustainable development in the region. Strengthening technical cooperation is also an important safeguard for the continued existence of APEC, and makes APEC a more vibrant institution.

Since APEC's establishment in 1989, economic and technical cooperation has undergone three stages.

INITIAL STAGE, 1989-92

During the initial years of APEC, there was much talk about APEC organisations. When talking about the concrete activities of APEC, people also discussed issues concerning the liberalisation of trade and investment. Although some cooperative activities have been conducted—in fields such as economic research, trade liberalisation, investment, technology transfer, human resources development and infrastructure industries—most activities focused on consultation and had few concrete outcomes.

ESTABLISHING THE BASIC PRINCIPLES OF ECOTECH, 1993-95

Although the Seattle Summit in 1993 failed to make significant contributions to economic and technical cooperation, it established an approach to future economic and technical cooperation. The concept was to launch the Asia Pacific community through TILF. This notion of community spirit later became the foundation for economic and technical cooperation (ecotech). Economic and technical cooperation was listed as one of the three pillars of APEC activities in the Bogor Declaration at the informal meeting of APEC leaders held in 1994. The importance of economic and technical cooperation was reiterated in the Osaka Program of Action at the informal Osaka APEC leaders' meeting in 1995. The program also used the concept of economic and technical cooperation to replace the concept of development cooperation in a bid to distinguish it from the traditional notion of development assistance. It also laid down the principles of mutual respect, mutual benefit and voluntary participation in economic and technical cooperation and defined three basic aspects of ecotech: common policy

concepts, joint activities and policy dialogue. Activities included research, data and information sharing, surveys, training programs, seminars, technical demonstrations, exchange of experts and establishment of research and business networks. In addition, it listed 13 fields for cooperation: human resources development, trade and investment data, trade promotion, industrial knowledge and technology, energy, ocean resources protection, fishery, telecommunications, transportation, tourism, small and medium-sized enterprises, economic infrastructure and agricultural technologies. All these represented constructive steps towards boosting technical cooperation.

Meanwhile, a new mode of cooperation, different from the traditional donor–recipient relationship system, was established, based on economic and technical cooperation. Private enterprises and other related organisations were to be encouraged to take part in cooperative activities while the market mechanism was to play a role in providing an activity system for technical cooperation.

Japan proposed the establishment of ‘Partners for Progress’ (PFP) and provided 10 billion yen to fund economic and technical cooperation. However, the money was used mainly to support TILF. As pointed out in the Osaka Ministerial Meeting Joint Statement, ‘PFP will cover all aspects of economic and technical cooperation with an emphasis on directly supporting TILF cooperation’. This indicated that although developed members would like to provide more technical support and assistance to promote the opening up of the Asia Pacific market, the extent of economic and technical cooperation they advocated still fell short of the type of cooperation required by developing members.

IMPLEMENTATION STAGE, 1996

It became clear that APEC members could benefit much more from the sustainable development of the Asia Pacific economy than simply through trade and investment liberalisation in the region. In 1996, for the first time, economic and technical cooperation was listed on the agenda of the APEC ministerial meeting held in Manila. ‘The Framework Declaration on Enhancing Economic and Technical Cooperation’—a key document guiding APEC economic and technical cooperation—was passed at the meeting. This declaration pointed out that the targets of APEC technical cooperation were to realise sustainable and equal development in the Asia Pacific region, to narrow disparities in economic development among members, and to improve people’s economic and social life. Cooperation would adhere to the principles of equality, mutual respect, mutual benefit and consensus. In addition, constructive partnerships would be established. The declaration also listed six priority fields: human resources development; developing stable, safe and effective capital markets; strengthening economic infrastructure facilities; utilising future technologies; protecting the environment; and enhancing the vitality of medium and small-sized enterprises. The Manila meeting made important progress in economic and technical cooperation.

FEATURES OF ECONOMIC AND TECHNICAL COOPERATION

Diversity is the most important feature of APEC's membership, which is characterised by relatively large gaps in technical development levels. Developed members have more advanced production technologies while developing members lack, or have not yet developed, appropriate new technologies for industrial transformation. Such a gap is the basis for technical cooperation, but it also presents a challenge. Disparities in technological development among APEC members are the motivation for cooperation. Through technology transfer, the exporter can recover most of the capital required to fund research, development or the introduction of more advanced technologies and produce products with more added value, while importers can save on the cost of technology development and market exploration. Moreover, they only need to make a small investment in training because of the relatively low level of the introduced technologies. Such technical cooperation benefits both parties. Traditional technical cooperation mode no longer meets the demands of economic development in the Asia Pacific region. Although the essence of cooperation—the transfer of technologies from developed members to developing members—has not changed, the traditional mode is a one-way flow of financial resources whereby wealthy countries offer aid to poorer countries. Such cooperation, aimed at narrowing the income gap, and mainly funded by government, does not narrow the development gap. An additional difficulty in reaching cooperation targets is reductions in government input. Reform is required, although APEC technical cooperation does not rule out the possibility of adopting the traditional approaches to cooperation. This is what is known as the APEC-style ecotech system, which has several defining characteristics.

A REASSESSMENT: FROM INEQUALITY TO RELATIVE EQUALITY

APEC demonstrated a spirit of openness, equality and progress in the Seoul Declaration. It first cast off the closed organisational style that had been adopted by traditional regional organisations, opening its door not only to members but also to non-member countries. Members are required to be as impartial as possible. APEC respects the diversity of its members, arising from economic and technical disparities. In addition, consultation and voluntary participation are the effective principles propelling APEC progress and providing new guidelines for APEC economic and technical cooperation. Cooperation among members must be based on equality and voluntary participation. APEC members respect each other in their cooperation and contribute to the cooperative process according to their own capacities. Such cooperative partnerships are rare in traditional forms of economic cooperation. In the past, partners in cooperation were not equal, as the side with the technological advantage usually attached many provisos to the cooperation.

This restricted the development of mutual interests and made it hard for cooperation to be lasting. Today, although the levels of technological development remain unequal in APEC cooperation, cooperative partners are of equal status. Developing members enjoy ownership in cooperative ventures while developed members also benefit from cooperation. The new cooperative mode takes into consideration the needs and interests of both parties. The establishment of equal relationships enables both sides to benefit from APEC technical cooperation and leads to the establishment of sincere friendship, which helps to make the cooperation enduring.

A REASSESSMENT: FROM ODA TO ECOTECH

The basic model for traditional cooperation is that developed members (wealthy countries) offer official development assistance (ODA) to developing members (poor countries) and the relationship between the two is that of donor and recipient. This model played a role in boosting the economic development of recipient countries. However, this cooperation model stresses the demands and interests of one side only and projects usually included non-economic or indirect economic goals. Such a model is inappropriate to APEC member development. The traditional model must be reformed in the context of APEC economic and technical cooperation and a new model of co-investment of resources needs to be adopted, under which cooperation is a matter of common willingness, requiring joint efforts, while cooperative targets are reached through sharing specialised knowledge and experience. For example, when dealing with environmental protection problems, although they possess the relevant technologies, developed members still require assistance from developing members in fields such as information, capital and qualified personnel. The APEC economic and technical cooperation model stresses the co-investment of both parties' resources—including knowledge, technology, human resources, capital and experience—to improve the benefits of technical cooperation. Ecotech is a complement to, rather than substitute for, ODA (Manzano and Villacorta 1996) because there is no way for ecotech to replace ODA, either in the scale of capital or in the mode of cooperation. Perhaps the most important contribution of ecotech is not direct financing but the establishment of networks and cooperative systems within APEC.

A REASSESSMENT: FROM GOVERNMENT BEHAVIOUR TO NON-GOVERNMENT BEHAVIOUR

Most traditional technical cooperation projects are conducted by governments with little private sector involvement. Changes in government foreign assistance policies—including financial cutbacks by donor countries, reductions in foreign assistance budgets and new policies—might offset the effect of such aid and affect the scale, level and achievement of technical cooperation. They also lead to a lack of long-term systematic safeguards in cooperation. As well as fluctuations

in the market mechanism, government administrative behaviour can also affect cooperation. The scope of cooperation will be limited if governments act as the principal players in cooperation. For example, most assistance is directed towards public utilities, but most recipient countries in fact need cooperation in a range of other sectors. Sole reliance on government input no longer meets the demands of APEC members in cooperation. It has become imperative to attract the involvement of the private sector and improve cooperative efficiency through the market mechanism. In fact, given its possession of both technologies and capital, the private sector—as long as it is interested in cooperative projects—should be encouraged to participate in cooperation while governments concentrate on facilitating private sector cooperation. Such a model would not only expand the scale, deepen the level, and add vigour to cooperation among APEC members, it would also have a far-reaching impact on common economic development in the Asia Pacific region. In addition, introduction of the market mechanism would enable the selection, investment and use of projects to be more efficient, thereby reducing waste and making the projects truly mutually beneficial.

MAJOR ACHIEVEMENTS IN TECHNICAL COOPERATION IN THE ASIA PACIFIC REGION

BILATERAL AND MULTILATERAL COOPERATION UNDER THE APEC FRAMEWORK

After a start-up period, APEC has defined 13 fields for economic and technical cooperation while 13 corresponding workshops have been established and 320 cooperative projects (including 151 subsidiary projects) have been launched (Table 12.1). The cooperative projects were proposed by the governments of APEC economies, based on the principle of voluntary participation, while cooperative funding was mainly provided by project initiators with some assistance from APEC central funds.

Cooperation in the 13 fields has helped to improve the fundamentals of sustainable economic development in such fields as human resources development, infrastructure construction, small and medium-sized enterprises and science and technology. It has facilitated economic cooperation in areas such as the establishment of information networks that issue regular economic information. It has reduced the trading costs of economic activities and increased economic efficiency through efforts to promote standardisation, and has strengthened consultation on policy issues among economic bodies through policy dialogues in the 13 sectors.

Under the general framework of economic and technical cooperation, the priority theme that encompasses the largest of the APEC activities in the area of science and technology is 'harnessing technologies for the future'. At present, there are 45 activities identified under this area (Table 12.2). Among them, 31 activities are designed mainly to help absorb existing industrial science and technology, while 14 activities focus on developing new technologies for the future.

The role of workshops in promoting technical cooperation includes

- promoting the upgrading of the technological capability of members, such as the work undertaken by the Human Resources Development (HRD) workshop in improving the quality of human resources, research work by the Industrial Science and Technology (IST) workshop on personnel exchange and technical personnel training, and industrial knowledge education seminars undertaken by IST and HRD
- promoting the infrastructure for environmental technical transfer, such as the trans-cultural technical transfer research and property rights training carried out by the HRD workshop, research on trans-cultural technical transfer carried out by the IST, the collective action plan made by the CTI on improving transparency in the field of property rights, and the work on foreign direct investment (FDI) and Market Framework Policies carried out by the European Community (EC)
- strengthening the establishment of information networks on technical proliferation among members, such as the APEC technology internet carried out by the IST workshop and technology exchange and training in small and medium-size enterprises undertaken by the APEC centres
- solving technical problems in specific departments, such as work done by the telecom, energy and agricultural technological cooperation workshops.

Table 12.1 Activities in the 13 ecotech areas, November 1996

Area	Total number	Completed
Trade and investment data (TID)	5	2
Trade promotion (TP)	13	8
Industrial science and technology (IST)	41	20
Human resource development (HRD)	86	29
Regional energy cooperation (Energy)	43	30
Marine resource conservation (Marine)	7	4
Fisheries (Fisheries)	12	6
Telecommunications (Telecom)	26	7
Transportation (Trans)	13	1
Tourism	10	7
Small and medium enterprises (SME)	20	10
Economic infrastructure (Infra)	9	1
Agricultural technology (Agr. Tech)	35	3
Total	320	120

Source: Yamazawa, I., 1997. 'APEC's economic and technical cooperation: evolution and tasks ahead', in Andrew Elek (ed.), *Building an Asia Pacific Community: development cooperation within APEC*, Foundation for Development Cooperation, Brisbane:45.

ECONOMIC AND TECHNICAL COOPERATION AMONG APEC MEMBERS OUTSIDE THE APEC FRAMEWORK

There had been extensive technical cooperation in the Asia Pacific region encompassing almost all economic sectors prior to the establishment of APEC; its role in the economic development of APEC members was not negligible.

The principal components of cooperation outside the APEC framework included: international or regional multilateral economic organisations such as the United Nations Development Program and its specialised organisation, the United Nations Industrial Development Organisation (UNIDO), the World Bank, the International Monetary Fund, the Development Assistance Council of the OECD and the Asian Development Bank; bilateral development assistance organisations such as American International Development, Japan's Overseas Economic Cooperation Fund, and Canada's International Development Association; international multilateral or bilateral non-governmental organisations (NGOs) such as private funds, research institutions and non-governmental development institutions; and, private activities such as FDI undertaken by multinational companies.

The position and role of these cooperation agencies are changing in line with changes in the world economic structure. The changes include the gradually decreasing role of government in cooperation, and the growing role of private organisations. In the 1990s, great changes have taken place in the structure of

Table 12.2 Types of and priorities for harnessing technologies for the future

		Number
Types	Total	45
	Seminar/conference/workshop	8
	Survey/research/publication	14
	Network/database	6
	Policy reform activities	6
	Mixed/other	11
Priorities	Total	45
	Improved infrastructure	22
	Improved business climate	7
	Enhanced policy dialogue	5
	Networking and partnership	11
Status	Total	45
	To be completed in 1998	15
	To be completed after 1998	13
	Ongoing/annual	9
	In preparation	8

Source: APEC Secretariat 1998.

external capital flowing to developing countries. The ratio of private capital has risen from 44 per cent in 1990 to 86 per cent in 1996, while the ratio of official development capital has continued to fall. The flow of foreign investment increased 5.5 times, accounting for 54 per cent of the total private capital flow to developing economies. Second, the ratio of governmental assistance in developed countries' GDP is gradually declining. The OCED's DAC noted in its report that the overseas aid budgets of donor countries continued to fall. ODA dropped 14 per cent between 1992 and 1995, and the type of assistance has also changed. Some of the aid for long-term development is now devoted to peace-keeping and emergency assistance. At the same time, new donors have emerged, such as the newly industrialising countries in Asia. Third, the distribution model for capital assistance is also changing. The achievements and efficiency of recipient countries have become the major standards for determining their eligibility for loan renewals. The World Bank International Development Assistance now lists indices of achievements and efficiency in the distribution system for its shrinking assistance funds. Major indices to assess recipient countries include economic stability and structural reform, poverty reduction efforts and the quality of the loan portfolio under implementation.

Economic and technical cooperation outside the APEC framework has several distinguishing features. The partners in cooperation tend to have strong fund-raising capability, are able to undertake large-scale cooperative projects and guarantee capital resources, and have well-developed specialised functions that enable them to accomplish definition, management, examination and evaluation of the projects. The partners, having been engaged in technical work over long periods of time, have accumulated significant experience and knowledge. Finally, the partners have won the trust of APEC member governments—especially developing members—which makes it easy for projects to be conducted among members. As for the capital scale of cooperation projects, non-APEC ecotech projects have established a much better track record than that of APEC economic development. This is of great importance to sustainable economic development in the Asia Pacific region. Of course, the two kinds of cooperation are not comparable because APEC's role is not principally one of cooperation; it has limited fund-raising ability and it has just begun to engage in ecotech. The purpose of this discussion of the achievements of non-APEC cooperation is to explore ways to incorporate such forms of cooperation into APEC's ecotech process.

MAJOR PROBLEMS IN APEC ECONOMIC AND TECHNICAL COOPERATION

APEC has made great strides in economic and technical cooperation. The major problem now is how to give more scope to technical cooperation in promoting sustainable economic development. To date, APEC has not made enough progress in facilitating technical cooperation.

It took a long time to reach unanimity on technical cooperation and this hindered the process. In the initial stages, economic and technical cooperation was organised as a complement to TILF, with targets set in line with the common development of APEC members. Generally, these projects were not very practical. In a report made by the APEC Economic Committee, only long-term targets for economic and technical cooperation were set, and no concrete measures to strengthen short-term cooperation were mentioned. Meanwhile, the criteria for evaluating activities—such as goal-orientation and explicit performance criteria—were very abstract, making it difficult to direct cooperative activities.

Second, although many economic and technical activities have been discussed, few have been put into action. At present, most APEC economic and technical cooperation activities are preparatory in nature—chiefly information collection, research and discussion. Although such activities help to improve the environment for economic activity, they have little direct economic impact. For example, environmental protection has become a severe problem and a hot topic in the Asia Pacific region. However, a lot of barriers must be overcome before environmental protection projects can be implemented in this area. Few cooperation projects concerning environmental protection have been finalised between developing and developed members, especially in the technology sector. More cooperation among APEC members is needed to solve environmental problems. Such cooperation should be based on the overall interests of the region.

Third, cooperation projects lack sufficient start-up capital. At present, most APEC cooperation projects are selected and funded by APEC members with part of the capital coming from APEC's central fund. Implementation of economic and technical cooperative projects is restricted by the limited capital provided by APEC member governments and the limited capital raised by APEC itself. Budgeted expenditure for economic and technical cooperation was a mere US\$809,000 under the 1997 APEC budget approved by the Manila meeting. In sharp contrast, the scale of projects funded by ODA is much larger. Although no average budget scale for bilateral economic and technical cooperation is available, it is estimated to be 10 to 20 times the scale of APEC economic and technical cooperation. Yamazawa (1996) estimates that APEC funding for economic and technical cooperation comprises no more than 0.1 per cent of total ODA.

Fourth, there remains a paucity of successful examples and operating models to assess project implementation. Most ongoing technical cooperative projects are small in scale and urgently needed; large-scale projects are few.

There is a simple explanation for APEC's failure to achieve the expected results. The diversity of its members is the basis for cooperation. At the same time, however, such diversity exacerbates the difficulties of cooperation.

Some developed members believe that technical cooperation mainly refers to technical assistance from developed to developing members, without recognising the mutual benefits. Some developed members also feel that they gain less than

they expend. In the process of promoting the mobilisation of technology and knowledge, developed members are reluctant to embark on technology trade in the same liberalised manner as commodity and capital trade. Instead, they often adopt conservative or even restrictive technology trade and prefer to maximise the sale of products while minimising the sale of technologies. When they do transfer technology, they often attach harsh terms to it. The technology monopoly of developed members and the restrictive measures they adopt in technology trade are the major reasons for difficulties in conducting technical cooperation among APEC members.

Developing members must strive to create better preconditions for bilateral cooperation. Cooperation requires developing members to improve the quality of their labour force, attract more domestic reserves to increase cooperative funding, reform domestic systems to establish efficient and convenient cooperative institutions in order to reduce the unnecessary spending caused by blockages in the system, readjust relevant domestic policies to provide criteria for the selection of cooperative projects, and make APEC technical cooperation more efficient by reducing their own internal barriers.

APEC has failed to fulfil its unique role in technical cooperation. Just as was the case with the realisation of TILF, APEC needs to create the conditions necessary to enable the free mobilisation of knowledge and technology among its members. APEC is not a funding entity; it cannot fund specific technical cooperation projects as the main form of its participation in cooperation. This aspect distinguishes it from other multilateral organisations. However, APEC has the ability to influence member governments and to encourage members to speed up the mobilisation of knowledge and technology through implementing some of its decisions to abolish restrictions. In addition, it can create a more accommodating and efficient environment for technical cooperation. Virtually no other multilateral organisation can fulfil these functions. APEC should do more in the following regard: strengthen information collection to avoid duplication of cooperative projects, help member governments coordinate and communicate their technical policies, and stimulate the interest of private organisations in participating in technical cooperation and gradually enable private organisations to engage in meaningful and large-scale technical cooperation. At present, few cooperation projects directly involve private organisations, mainly due to the disparity between technical cooperation projects and the areas of private interests. Meanwhile, private organisations are becoming more cautious about technology transfer, creating a further restriction on their participation in cooperation. In addition, APEC has not yet created enough stimulus to encourage the participation of the private sector. Strengthening coordination between APEC and other cooperation organisations is essential. Other multilateral organisations have a greater capacity to raise funds and have accumulated much experience over the years. Some multilateral organisations continue to be heavily involved

in technical cooperation projects. By coordinating these projects, APEC cannot only avoid duplication of and competition between projects, but also give full play to the potential for cooperative funding.

CREATING AN ENVIRONMENT CONDUCTIVE TO ECONOMIC AND TECHNOLOGICAL COOPERATION

Strengthening economic and technological cooperation and promoting sustainable development in the Asia Pacific region requires a joint effort by government and the private sector. Such efforts will enable the creation of an environment conducive to the free flow of knowledge and technologies so that economic and technological cooperation can achieve their full potential.

ROLE OF GOVERNMENT

Governments of member economies play an extremely important role in APEC economic and technological cooperation. They can determine the orientation of the cooperation on the basis of their own national interests and with regard to the interests of other member states. The role of government is multi-faceted.

INFLUENCING ECONOMIC AND TECHNOLOGICAL COOPERATION THROUGH APEC

As participants in APEC's various working teams and committees are all representatives of the corresponding organisations of member states' governments, the activities of APEC's working organisations at different levels can be regarded as an extension of the work of those corresponding organisations. According to APEC's principle of consensus, APEC has neither the ability nor any mechanism to influence the governments of member states directly. Governments of member states can influence the formulation of APEC's policy frameworks through the participation of their corresponding organisations in APEC's activities; they can influence the selection and determination of APEC's stated objectives through APEC working teams; they can influence the selection and determination of multilateral organisations' stated objectives through APEC's stated objectives; and they can influence the direction of the private sector's economic activities through the stated objectives of APEC and multilateral organisations.

IMPROVING THE DOMESTIC POLICY ENVIRONMENT

Governments of member states can formulate policies and legislation in accordance with APEC's regional policy frameworks in a bid to encourage and support technological cooperation both within and outside APEC. They can also make efforts to improve their policymaking processes by making them more transparent. This will aid in the opening-up of market systems, which will in turn encourage technological cooperation among member states. It is suggested

that developed member states could emphasise the adjustment of their domestic technological policies and coordination between their technological and other policies—such as trade policies—so as to minimise the restrictions on and obstacles to technological cooperation. The efforts of governments should centre on reform of their domestic economic structures and policies, with a view to reducing unnecessary transaction costs, thereby enhancing the effective flow of knowledge and technologies and encouraging private sector participation. At the same time, there should be sustained policy dialogue between developed and developing members to consolidate policy consistency.

SPEEDING UP INFRASTRUCTURE DEVELOPMENT

Governments of member states can create an environment conducive to technological cooperation by accelerating the construction of infrastructure in the region. Emphasis should be placed on the construction, rejuvenation and refining of energy, transportation and communication installations. Equally important is improvement in the management of financial systems and development of information networks.

Governments should give priority to the establishment of an information network, installing hardware and including relevant information about their respective countries on the network. The information should include: government policies and legislation, which constitute an important step in enhancing the transparency of government policies; government statements on the objectives of technological cooperation, which can be used to guide the direction of economic and technological cooperation; and the present status of economic development, which can be used to assess economic development trends and the prospects for cooperation.

RESOURCES AND PARTICIPATION IN ECONOMIC AND TECHNOLOGICAL COOPERATION

In view of the diminishing capacity of governments of member states to contribute to economic and technological cooperation, there is a need to emphasise the orientation and ‘demonstration by example’ effect of technological cooperation and to support or guide input from other sources, especially the private sector. Government input can be directed inward or outward. Inwardly-directed input centres on guiding industry and embarking on structural adjustments. Outwardly-directed input takes two different forms. The first is bilateral participation, such as ODA, a form that has been widely used and one through which governments can support the transfer of enhanced technological content in ODA projects. The other form is multilateral participation. Under this type of cooperation, all parties can participate as multilateral cooperating partners without encountering the kind of friction that often emerges in bilateral participation. This form of input not only

decreases the risks faced by participants, but also enlarges the scope of the recipient parties, and it is now attracting increasing interest from APEC member economies.

ROLE OF NGOS

NGOs include private foundations, research institutions and non-governmental development institutions. Most NGOs in the developing member states of APEC lag far behind their counterparts in the developed member states both in terms of the number of organisations and their activities. The principal NGOs in APEC are PBEC, PECC and ABAC. Through their commitment to assisting APEC in research work for the formulation of APEC policy frameworks, they have become one of the links between governmental organisations and the business community. They tend to be strongly directed towards technological cooperation. Their functions mainly include: (for those with fund-raising ability) supporting policy research work and cooperation projects such as small and medium-scale technological and personnel exchanges and training; undertaking or managing cooperation projects (regardless of the source of the funds); enhancing the public's understanding of and support for APEC's cooperative mechanisms; and, helping APEC evaluate and supervise the progress, impact and effects of its economic and technological cooperation projects from a relatively objective and independent standpoint.

ROLE OF THE PRIVATE SECTOR

The private sector will gradually replace governments as the leading player in APEC's ecotech programs and become the main conduit for economic and technological cooperation. It will play an increasingly important role in fund-raising and technological development and transfers.

Participation of private businesses in technological cooperation is clearly and directly motivated by self-interest and so is easily affected by market principles. The basic functions of private business are to act as the major funding source for economic and technological cooperation; to take a major role in or directly undertake economic and technological cooperation projects in the APEC region; and to undertake or manage economic and technological cooperation projects financed by funds from non-free capital sources. Under certain conditions—characterised by clearcut policies, a stable economic environment and favourable prospects for the project—the private sector also undertakes or manages large-scale long-term infrastructure projects.

ROLE OF APEC

To promote economic and technological cooperation in the region, APEC needs to speed up the creation of a favourable and accommodating environment for such cooperation. Its main functions are collection of information and coordination of projects.

COLLECTION OF INFORMATION

Sharing information is an important precondition for strengthening economic and technological cooperation in APEC. Of most importance is sharing information about ways to create and preserve highly efficient manpower resources, and information about infrastructures and technological capabilities. Accelerating the creation of a good information environment for APEC will lower the transaction costs of collecting and using information and reduce research and development (R&D) expenses. Emphasis should be placed on comprehensive information processing and establishing storehouses for collecting information about technological capabilities and information networks.

Policy-collecting storehouses can help to enhance the policy transparency of member states and can play a role in indirect policy coordination because they enable member states' governments to consult directly on policy issues and make comparisons between them. Information processing and analysis provide governments with the contents of their respective stated objectives, and furnish forecasts on economic development trends and potential input directions. The limited resources available should be utilised selectively to carry out information cooperation projects of an appropriate scale, mainly to conduct exchanges of personnel and technologies. These exchanges may take two forms. The first involves setting up APEC training centres that focus on projects requiring more specialised installations. The second concerns the organisation of APEC mobile training groups in charge of projects requiring less specialised installations. The latter may incorporate lectures by professionals in the fields concerned and the recruitment of local trainees by the governments of member states.

COORDINATION OF PROJECTS

Within APEC, there are already several organisations capable of supporting economic and technological cooperation. In particular, there are specialised financial institutions with well-established systems, substantial experience and competence in the areas of multilateral fund-raising, investment and management. The fact that systems are in place means that the costs of technological cooperation should be minimal. APEC has several coordination functions, including

- strengthening ties between and among the governments of member states, multilateral governmental organisations, NGOs and the private sector within the APEC region; arranging projects around the objectives of cooperation so as to avoid duplication of projects or excessive competition between various projects; and, increasing the efficiency of fund utilisation
- attaching significance to the multilateral input provided by non-multilateral institutions and to projects with multilateral beneficiaries, with the aim of reducing the friction often present in traditional forms of bilateral cooperation. When multilateral institutions select projects, they should

make more use of market forces to determine their stated objectives and enhance the projects' ability to give private capital clear objectives to guide their actions. This is of great significance if private capital is to undertake follow-up investments in projects in accordance with specific stated objectives

- allowing non-members to participate in APEC-related projects so as to enlarge the scope of economic and technological cooperation in the region. It is suggested that to make use of the limited resources for technological projects at the regional level, the whole region needs to undertake R&D and to set up common R&D institutions at the APEC level to promote technological cooperation.

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