

Technology Transfer Workshop for Asia and the Pacific

Country Paper: Japan

1. Introduction

The Asia and the Pacific region has a vast size and diversity. The region has 30% of land and 60% of population of the world. High population density and industrial development in some parts of the region has been causing environmental pollution, soil degradation, and loss of bio-diversity. On the other hand, eradication of poverty is still the most important policy issue in many parts of the region. One third of the population do not have access to safe water. Scarcity of water resources as well as insufficient irrigation and other water supply schemes may hinder future agricultural development. Greenhouse gas emissions from most of Asia and the Pacific countries are relatively at a low level, but rapid industrialisation in the future might cause a rather fast increase of such emissions. Existence of many mega-cities, the number of which is rapidly increasing, implies a highly concentrated consumption and emission of GHGs, while extensive infrastructure in such cities may imply a good potential for higher efficiency and economic development.

The region has many completely divergent facets in the context of climatic change. The region;

- includes from areas with concentrated human activities such as highly urbanised and artificially managed areas to those areas with dispersed industrial activities such as undisturbed natural indigenous forests;
- shows contrasts between intensive infrastructure and services in some areas and their absence in many other parts of the region; coexistence of material abundance and poverty; highly industrialised areas and subsistence economy areas; and,
- has a large number of island countries, which requires very specific attention to the needs and transfer of adaptation technologies particularly for these countries in the discussions of international technology transfer.

The most important characteristic is, however, that the region is a fast developing region. It is expected that the economic development, which has been slowed down in the recent few years, would re-gain its momentum. While such economic development in the region would offer great opportunities for eradication of remaining poverty in the region, such development would, unless it is properly designed and targeted at sustainable development, seriously endanger the future of environmental and human resources of the region and, eventually, of the earth.

Such environmentally sound development of the region would have to be assured with technology transfers, especially of advanced industrial production technologies as well as a high level of foreign direct investments. In order to further promote such transfers of industrial technologies and, at the same time, to facilitate especially the transfers of environmentally sound technologies, there is a need to explore various avenues, based upon past and ongoing activities, by which sustainable technology transfer is to be achieved. In doing so, a particular attention should be paid to the creation of enabling environment for the transfer of environmentally sound technologies.

The Clean Development Mechanisms (CDM) under the provisions of the Kyoto Protocol

would offer new particular opportunities for sustainable development of the developing countries in the region. CDM projects would, by definition, involve and ensure international transfer of environmentally sound technologies.

In considering the questions of technology transfer in and to the region, the above-mentioned divergences within the region require additional challenges. Such challenges include, most importantly, the identification of national needs, priorities and most appropriate sets of technologies, utilisation of currently available technology transfer systems and elaboration of new and innovative sets of technology transfer approaches as well as identification of different requirements of financial or human resources. In such challenges, it appears that discussions over promoting technology transfer would be out of focus or reality, unless they are done in direct linkage and relevance to actual needs of countries and localities. The Government of Japan therefore recognises that learning lessons from past and on-going technology transfer efforts is of particular importance and expects the three regional workshops under the consultative process to be instrumental in this regard.

2. Plans, policies and activities (of the Annex I Government concerned) to implement Article 4.5 of the convention

(Overall policy)

At the third session of the Conference of the Parties to the UNFCCC, the Government of Japan announced the Kyoto Initiative, which is composed of the three pillars, namely;

- 1) **Co-operation for human resources development:** For a five-year period from 1998, Japan is providing training in developing countries for 3,000 technical officers, researchers and administrators. (Achievements in FY 1998: 1,154).
- 2) **Provision of yen loans with the most concessional terms:** Japan is providing ODA loans with the most concessional terms of 0.75% annual interest and a 40-year repayment period to promote activities in the fields of energy conservation, development of new and renewable energy sources, and forest conservation and afforestation.
- 3) **Transfer and utilisation of Japanese technology and know-how**

Support for the capacity-building efforts by governments is essential. The primary prioritisation should be made by the recipient country, and therefore, it is important for each developing country to provide relevant information through its own national communication. In addition, it is vital that developing countries prepare systems that enable technology transfers to proceed smoothly. For this purpose, administrative dialogues on effective measures, including co-ordination with discussions in the process of negotiations on economic matters, are beneficial.

Demand for technologies for the prevention of pollution, cleaner production, etc. is growing for the purpose of improving environmental management capabilities (monitoring, regulatory capabilities, etc.). As a result, technology transfers in this field are being promoted. In the public sector, Japan is continuing its efforts for the transfer of environmental management technologies through its positive and comprehensive assistance under its ODA and other schemes, which includes the training of personnel, dispatch of specialists, and provision of equipment. Similarly, in the private sector, numerous projects are being carried out that are contributing to technology transfers.

As to adaptation technologies it is important to note that some developing countries could be already experiencing adverse effects that are related to sea level rise, e.g., destruction of coastal forests, salt infiltration into potential carbon stocks such as inland vegetation and

farmland. Besides, in highly fragile regions, mangroves, which could serve as a coastal buffer zone, are being destroyed, corals are decaying, cyclone damages are worsening, and coastlines are being eroded. Global warming will also change the behavioural patterns of typhoons, cyclones and hurricanes in frequency, routes and magnitude. It will also alter precipitation patterns and the sea water temperature. For island countries and countries with long coastlines in the region, promotion of adaptation technologies and their international transfer are of vital importance.

Adaptation measures should include information measures (e.g. monitoring, impact assessment, and information provision), policy measures (e.g. coastal management, disaster prevention, environmental management, and land-use regulations) and technical measures (including both hardware technology such as seawall construction, and software technology such as beach nourishment and coastal afforestation). Coastal adaptive technology to be developed and transferred must cover information and policy measures as well, because technical factors in these measures are as significant as those in technological measures.

Adaptability enhancement in both technical and sociological aspects, is not only useful in dealing with today's difficulties facing vulnerable countries, but in enabling them to prepare for even more serious impacts of global warming in the future. It is particularly useful to strengthen their capabilities at as early stages as possible, since global warming is causing not only sea level rises but also changes in the behavioural pattern of typhoons, cyclones, and hurricanes.

On the basis of the above recognition, Japan is studying adaptive measures to global warming, *inter alia*, measures related to sea level rise and agricultural production. For instance, Japan supported and will continue to do so in afforestation and reforestation for stabilisation of the coastal zones using its grant aid and technical co-operation schemes. As Japan possesses relevant ocean technologies to observe tide-level variations and wave height, the country is ready to share them with vulnerable States as the need arises. Furthermore, Japan engages in efforts to develop impact assessment methods, and is conducting a survey for several Asia-Pacific countries to help them assess global warming impacts on them.

The Government of Japan considers that among the publicly owned technologies, those in the following areas are most important. White Papers and reports of findings by government agencies and government-affiliated research institutions, relevant to these technologies, are available on the Internet. As ways to promote the transfer of these kinds of technologies, training and studies at government-related organisations and the dispatch of government specialists have been carried out.

- Environmental management technology (environmental regulations, monitoring technology)
- Energy-conserving and new energy technologies
- Forestry
- Meteorological observation
- Waste disposal and management

With a view to promoting co-operation in research on global changes in the Asia-Pacific region, Japan has been playing a leading role in initiating the "Asia-Pacific Network for Global Change Research" in co-operation with some other countries in the region. Climate change is designated as a priority area in the research, and workshops for climate change vulnerability and adaptation assessment in Pacific Island Countries are being supported in Fiscal 1999.

(Specific actions)

To promote technology transfers, Japan has been making various efforts such as dispatching teams of technical specialists, building information networks, holding workshops, and so forth. Within the framework of Japan's ODA, Japan has been carrying out technology transfers for various developing countries, establishing environment centres in those countries and, with those centres as focal points, helping to diffuse technologies in those countries. Compared with other types of assistance schemes, ODA programmes have some advantages: they could be conceived even when short-term economic return is not favourable, and they could also be developed and implemented in harmony with development programmes or projects of the host countries. Thus, ODA programmes could strongly support the long-term and environmentally sound development.

Also with financial resources other than the ODA budget, Japan is contributing to environmental management actions by developing countries. The Ministry of International Trade and Industry, for instance, is implementing the Green Aid Plan (GAP) that aims at achieving both economic development and environmental protection in developing countries in Asia. Under the Plan, energy and environment technologies, some of which were developed through Japan's efforts against pollution, are transferred and utilised in developing countries. Most parts of the Plan are financed by budgets outside of ODA, though the ODA funds could also be used in the associated technological co-operation component.

In addition to transfers of technologies under project-type technical co-operation schemes, occasional transfers of technologies are done in forms of exchanges of technological information. Furthermore, the private sector plays an important role in technology transfer regarding combating global warming measures because it plays the leading part of technology development and utilisation. Various industry organisations and companies are contributing to improvements in manufacturing technologies and efficiency and human resources development overseas as part of voluntary actions aimed at preventing global warming. In Japan, organisations such as the Association for Overseas Technical Scholarship (AOTS) and the Japan Overseas Development Corporation (JODC) are promoting efforts being made by private companies, including the acceptance of trainees and dispatching experts, partially subsidised by the official development assistance (ODA) budget.

The Environment Agency of Japan has been organising the Environment Congress for Asia and the Pacific (ECO-Asia) to offer a forum for a free exchange of views at the ministerial level in order to promote co-operation in the environmental sector in the Asia-Pacific region. The conference has been held eight times since 1991, and the most recent one was held in Sapporo, Japan in September 1999. In order to promote exchanges of information on experiences with countermeasures against global warming, as well as personnel exchanges, Japan has held, since 1991, nine sessions of the Asia-Pacific Seminar on Global Warming. Japan has also been supporting the setting up of an Internet network throughout the Asia-Pacific region to advance exchanges of information about climate change with an emphasis on technology information.

On a bilateral level, Japan is holding discussions on the environment based on policy dialogues and environmental co-operation treaties with developing countries and assisting them in their efforts in this area. With China, for example, Japan has held the Japan-China Comprehensive Forum on the Environment Co-operation, and the Japan-China Environmental Co-operation Model City Plan.

Moreover, Japan has been active in contributing the promotion of the diffusion of technologies under the Climate Technology Initiative (CTI), which was founded by the proposal of 23 member countries of the IEA/OECD as well as the European Commission since the COP1 held in 1995.

The Annex to this paper shows some examples of major ODA and non-ODA projects as well as technological information exchange projects among various kinds of the transfers of technologies in both public and private sectors under government initiatives.

3. Attacking barriers to technology transfer

As for the barriers hindering the promotion of technology transfer, the Government of Japan believes that the following issues warrant close examination.

- Reduction of high costs, completion of incomplete infrastructure facilities,
- Rectification of gaps in basic technology,
- Increased transparency and efficiency of government administration (including regulations, licensing),
- Liberalisation of investment, opening of economy,
- Application of tax incentives,
- Expansion of demand for technology through introduction of environmental regulations,
- Development of human resources, and
- Improvement of access capabilities to information

Since technology transfers from newly industrialised and middle-developed countries to developing countries and the least developed countries make it possible to introduce suitable technologies at an expense lower than those countries had spent, such technology transfers are considered beneficial in addition to those technology transfers from more advanced countries.

Prioritisation based on specific conditions of each developing country should be established in those fields in which measures against global warming are essential. Such fields include energy conservation, disposal of waste materials, forest conservation and afforestation. Various ways should be established so that developed countries can provide needed information that responds to the priority needs of developing countries. As information tools like the Internet are becoming increasingly effective means for accessing information, developed countries are setting up information systems so that these access tools can be efficiently used by developing countries.

Information on emerging technologies should be added to that on existing technologies, and existing channels and systems for providing information should be improved. As to the transfer of such emerging technologies, in particular, it should be noted that investments by private enterprises will be encouraged by guarantees of intellectual property rights.

Information overseas can of course be accessed by utilising available information equipment and tools. Information can also be accessed by contacting the local embassies of the Annex II Party countries, offices of organisations engaged in international co-operation (for Japan, JICA, JETRO, NEDO, etc.), or representative organisations. Many environment-related organisations have been set up in numerous countries around the world, and they are offering a variety of consulting services. Should there be further requests from developing countries for improvement, Japan is prepared to study ways to strengthen these services.

For the promotion of information exchange on environmentally sound technologies, the Government of Japan believes that the following types of information management actions are of vital importance.

- Strengthening of the information management capacities of existing national and regional centres.
- Preparation of tools for sending information (Internet home pages, news letters, etc.).

At present there is a wealth of information available, but further improvements will become possible if feedback of requests for improvements are received after actual utilisation of existing equipment and facilities.

4. Harnessing investment opportunities and enhancing private sector participation

Since the private sector develops, possesses and operates almost all the technologies in the energy related and other fields, its role in technology transfer is extremely important. Because many foreign private companies operate commercially-based undertakings in developing countries, host countries themselves should endeavour to accumulate know-how through these projects. ODA and other official financing schemes can provide vital impetus for bringing projects to countries in which it may be difficult for private companies to establish undertakings by their own resources. In Japan, a number of private sector projects receive ODA subsidies through AOTS, JODC, NEDO or JICA, and other schemes including unique supporting scheme by JBIC public funds are providing opportunities for spontaneous transfers of technology and achieving significant results.

In order to promote private sector investment, efforts must be made by developed countries to carry out investigations to identify economic needs and to make developing countries aware of the technologies they possess. Developing countries should place emphasis on preparing conditions conducive to private sector investments. Such conditions include the arrangement of law in line with international investment rules and the preparation of statistics necessary for investment from overseas.

Private sector companies would not invest in areas with high risk or where the conditions for investment are severe. To attract projects to countries where investment cannot be introduced by the efforts of the private sector alone, the impetus provided by official funding by ODA and other schemes is effective.

5. Expected outcome of the consultative process

The Convention can oversee information exchanges at SBI and SBSTA through consideration of the National Communications from each country and the information presented by organisations co-operating for the achievement of the goals of UNFCCC. SBSTA is gathering information on the relevant activities, and it should report and make public its findings and evaluation at COP and other forums.

Japan hopes that the series of regional workshops being held under COP4 decision would provide specific insights and suggestions for future work of the UNFCCC, through, in particular;

- Identification of specific needs and priorities of countries for environmentally sound technologies in their pursuit of sustainable development,
- Identification of perceived barriers hindering technology transfers, as well as practical steps to remove such barriers,

- Consideration of specific actions to improve and facilitate capacity building actions, including promotion of awareness and consciousness of the general public, environmental education at all levels, and promotion of scientific research and technology development for sustainable development, and
- Exploration of various avenues, based upon past and ongoing activities, by which sustainable technology transfer is to be achieved,

6. Conclusions

In developed countries, the implementation of projects and the development of technologies have been realised through the steady and strenuous efforts of private and public sector researchers to utilise limited funds and human resources. The present technology transfer schemes have been established by making use of the lessons obtained through these efforts, which in turn would provide invaluable insights into future development of new and innovative approaches to the promotion of transfer of environmentally sound technologies.

Japan earnestly hopes that frank and open dialogues at regional workshops and at future UNFCCC meetings would come up with concrete agreements on transfer of environmentally sound technologies, which would contribute to the world's pursuit of sustainable development.

**Examples of international cooperation projects contributing to climate change abate
(excluding projects executed through international organisations)
(Non-exhaustive list)**

Area	Project name (Host Country)
Energy supply (Large scale power supply, etc.)	Project for Construction of Electric Training Center (Syria)
	Project for Rural Electrification in Ache (Indonesia)
	Project for the Environmental Protection and Safety Training Center of the Mi Coal Industry (China)
	Model Projects for Clean Coal Technology
	Rehabilitation of the Port Dickson Power Station (Malaysia)
	Feasibility Study in Power Grid Improvement for Damascus (Syria)
New and renewable energy technologies	Study on the Promotion of Photovoltaic Rural Electrification in the Republic of Zimbabwe
	Technical Cooperation in Promotion of Public Use of Solar Electricity Generation (Thailand)
	Demonstrative Research on PV Power Generation System for Battery Charging (Thailand)
	Project on the Exploration of Small-scale Geothermal Resources (Indonesia)
	Project for Solar Energy System Technology Development (for timber drying) (Indonesia)
Efficient use and conservation of energy resources	Model Project for Effective Utilization of Energy in Re-heating Furnaces in the Industry (Thailand)
	Model Project for Reduction of electric power consumption in cement plant (Vietnam)
Improvement of energy use and management in industrial sector	Industrial Energy Conservation in Argentina
	Studies in Energy Conservation Planning for Malaysia
	Dalian Energy Conservation Education Center (China)
Improvement of energy use and management in transport sector	Studies into Urban Transport System in Kuala Lumpur (Malaysia)

Area	Project name (Host Country)
	Feasibility Study on Introduction of Trolley Buses with Energy Conservation Improvement in Mexico City (Mexico)
	Feasibility Study on CO2 Reduction by Easing Traffic Congestion at Intersecti Bangkok City (Thailand)
Improvement of urban energy management, including waste management	Water Management in Wang River basin (Thailand (Lampang City))
	Cleaner Production Studies for Dalian Environmental Model Zone (China)
	Model Project for Utilization of Waste Heat from Incineration of Refuse (Chin
Improvement of energy resource use in agricultural sector	Study on Cartography, Inventory and Management of Classified Forest in Nort in Benin
	Forest Extension Project in the Eastern Region of Paraguay
	Forest Conservation and Afforestation Project in Laos
	Afforestation Center Project (Laos)
	Afforestation component of the Environmental Conservation Project for South-Coastal Area (The Philippines)
Reduction of GHGs emission	Research Cooperation Project on the practical use of industrial waste water treat technology for prevention of global warming (Thailand)
	Model Project for Coke Dry Quenching (China)
Provision and utilisation of information on ESTs	Establishment of systems to provide information on environmentally sound tec including the AP-NET, maESTro, and APEC Virtual Center (Japan) for Envirc Technology Exchange
Policy measures for abatement of climate change, including regulations and incentive	Training Courses to Develop National Inventories and Strategies Against Clim Change
	Energy Efficiency Center (China, Argentina and Bulgaria)

Area	Project name (Host Country)
Measures	National Center for Environment (Indonesia, China, Mexico, Chile, Egypt and
	Seminars against Global Warming in the Asia Pacific region
	Building up a Network on Climate Change in the Asia Pacific area
	AOTS Technical Training Program
	JODC Expert Dispatch program
Research and Development of technologies relevant to the needs of localities	Comprehensive Utilization of Natural Gas in Chongqing (China (Chongqing
Others	Technical transfer in CTI (Climate Technology Initiative)

Notes:

MFA:	Ministry of Foreign Affairs
EA:	Environment Agency
MHW:	Ministry of Health and Welfare
MAFF/FA:	Forestry Agency of the Ministry of Agriculture, Forestry and Fisheries
MITI:	Ministry of International Trade and Industry
JICA:	Japan International Cooperation Agency
JBIC:	Japanese Bank for International Cooperation
NEDO:	New Energy and Industrial Technology Development Organization
GEC:	Global Environment Center
AOTS:	Association for Overseas Technical Scholarship
JODC:	Japan Overseas Development Corporation