CHAPTER 4
THE COOPERATIVE ROLE AND ENVIRONMENTAL ASSISTANCES INCLUDING TECHNOLOGY TRANSFER OF JAPAN TOWARDS INTERNATIONAL WASTE MANAGEMENT AND THE 3R INITIATIVE

Global Environmental issues are a tremendously big challenge. Environmental problems at the present are not only national issues, but also become global concerns because environmental problems have unexpected ramifications which inevitably extend beyond territorial borders. Apart from the initiative role of Japan in the area of waste management, the involvement of Japan in international cooperation has taken a crucial role. In addition, Japan has provided environmental assistance in the form of support for assisting developing countries to solve the problems and further develop their communities. Japan has principally provided environmental assistances to developing countries in the form of large amounts of financial support, technical assistance and technology transfer in line with her commitment at the UNCED. Japan has been a forerunner of international efforts to assist developing countries to tackle environmental challenges.

In order to review the potential of Japan to become an international environmental leadership, this chapter highlights the cooperative movement of Japan in the international community through international cooperation on waste management. In addition, the environmental assistance Japan provided for developing countries towards waste treatment will also be examined.

A. The Cooperative Role of Japan towards International Waste Management and the 3R Initiative

Waste management has been regarded as a significant issue of environmental protection in the international community. In an endeavour to establish a sound material-cycle society at the global level, the sole domestic efforts of Japan are not

sufficient. The government of Japan has become aware of the importance of international cooperation to mutually achieve a sound material-cycle society. With regard to Japanese Fundamental Law for Establishing a Sound Material-Cycle Society, Article 31, it clearly stated that;

> "The State shall take necessary measure to promote international mutual cooperation on the establishment of a sound material-cycle society, including securing international cooperation on the recycling and disposal of recyclable resources, in view of the importance of establishing a sound material-cycle society under the international cooperation"[1]

The government of Japan has attempted to play a greater leading role for the global promotion of sound material-cycle societies calling for international cooperation on waste disposal and recycling-related issue through the 3R Initiative. International cooperation is regarded as a highly significant measure for further implementation and achievement in environmental fields. Moreover, international cooperation and information sharing are essential to promote the 3Rs. To share and exchange their experience on waste management between countries bring mutually beneficial and help to cope with issues of concern. The government of Japan has given a high priority to cross-border cooperation at regional and global levels in order to disseminate the 3Rs worldwide. The cooperative role of Japan has generally operated through regional forums and workshops. Information sharing of good examples and exchanging ideas on good practices are the main activities.

Apart from the G8 stage, the government of Japan has long cooperated with Basel Convention Project through Regional Centers for Training and Technology Transfer since the end of 1980s for maximizing waste disposal. Japan supported waste management in some states of Africa which encountered waste dumping by European countries.[2] The cooperative role of Japan with the Secretariat of the Basel Convention can be seen from the establishment of Regional Centers for Training and Technology

[1] Ministry of Environment, Japan, "Fundamental Law for Establishing a Sound Material-Cycle Society," http://www.env.go.jp/en/lar/wastelaw/SMCSlaw.pdf.

[2] Ministry of Environment, Japan, "Japan's Efforts to Address Global Environmental Issues," http://www.mofa.go.jp/policy/environment/pamph/2000/convention.html.

Transfer in Jakarta, Indonesia and in Beijing, China in 1997.[3] The government of Japan sent Japanese experts to Training Course of Hazardous Waste Management and Practice in Beijing in 1999 in order to provide information about practical knowledge and recycling technique to deal with waste management.[4] In addition, the government of Japan has played an important role as a host of Workshop on Prevention of Illegal Transboundary Movement of Wastes with close collaboration of the Basel Convention and its member countries. The Workshop on Prevention of Illegal Transboundary Movement of Wastes was held in Tokyo in December 2004. Ms. Yuriko Koike, former Minister of Environment, underlined the importance of information exchange and cooperation among countries. The promotion of 3Rs was addressed. In addition, the representative of Ministry of Environment of Japan proposed to establish the Asian Network for Prevention of Illegal Transboundary Movement of Waste.[5]

The government of Japan has also cooperated with the Asia-Pacific Forum for Environment and Development (APFED) to promote the 3R Initiative in the Asia and the Pacific. Japan was a host of APFED Expert Meeting on the 3Rs in Asia organized in Tokyo, Japan in March 2006.[6] During the meeting, the concept of Zero Emission Society and the Eco-Town project of Japan were addressed to promote waste management. The site of Kitakyushu Eco-Town Project was raised as a model city which has been successful in dealing with waste management and recycling activities in order to encourage international environmental cooperation among major cities in Asia.

---

[3] The Government of Japan has also supported financial contribution to Basel Convention to support regional and sub-regional centers since 1997. Japan provided financial support of US$ 350,000 for both centers in Indonesia and China.
United Nation Environment Programme, *Progress Report on the Activities Carried out by the Basel Convention Regional Centres for Training and Technology Transfer* (Geneva: United Nation, 2002).

[4] Secretariat of the Basel Convention, "The Current Status of the Basel Convention Regional Centres," http://www.basel.int/centers/regcentrestatus99.html.

[5] Ministry of Environment, Japan, "Workshop on Prevention of Illegal Transboundary Movement of Wastes," http://www.env.go.jp/press/file_view.php3?serial=6381&hou_id=5528.

[6] Institute for Global Environmental Strategies, *APFED Policy Dialogue Working Paper Series No.2: 3Rs in Asia* (Japan: IGES, 2006).

Furthermore, the Japanese Ministry of Environment supported Institute for Global Environmental Strategies (IGES), Asia Development Bank (ADB), and United Nations Environment Programme (UNEP) to organize South Asia 3R Expert Workshop at International Center for Mountain Development (ICIMOD) in Nepal Kathmandu in August 2006 with participation of forty experts from international organizations, governments, research institutes and NGOs.[7] The issue of domestic solid waste management, industrial waste management, medical waste and e-waste related to 3R were discussed. Mr. Takahiro Hasegawa, the Japanese representative of Office of Waste Disposal Management of Ministry of Environment, presented Japan's experience in waste management. He emphasized international cooperation to share Japanese experience with Asian countries to establish the sound material-cycle society.[8]

The government of Japan has worked to build a sound material-cycle society in line with the issue of waste management through the 3Rs concept and global warming. Japan continued to move forward by assisting other countries to handle problems of waste and develop proper waste disposal. According to the principle of Japan contributing to the world, Japan has made a major international contribution to the world with special attention to the global environment by using her financial and technological capabilities. Besides, her experiences and knowledge have been applied benefiting developing countries.

International cooperation and Japan's expertise in the field of waste management have provided environmental assistance because many countries lack of environmental awareness, knowledge including capacity for proper waste treatment and disposal. Waste minimization efforts of Japan in developing countries have supported capacity development[9] for waste management in order to form a sound material-cycle society.

---

[7] Institute for Global Environmental Strategies, "3R South Asia Expert Workshop," http://www.iges.or.jp/en/ltp/activity08.html.

[8] Institute for Global Environmental Strategies, "Japan's Experience in ESM and 3Rs," http://www.iges.or.jp/en/ltp/pdf/activity08/08_hasegawa.html.

[9] Regarding the UNDP, capacity in development is the ability of individuals, organizations and societies to perform functions, solve problems and set and achieve goals.

B. Japanese Environmental Assistance towards International Waste Management and the 3R Initiative

In response to the international environment, the implementation of Japanese environmental policies has broadened to include global environmental protection and assisting developing countries. Environmental assistance is an important channel of Japan to make a greater international contribution. The government of Japan has made substantial contributions to the international community in the environmental area. In such specific area of waste management, Japan has the financial resources, technical expertise and technological resources to help developing countries cope with the problem of waste in line with her experience and active efforts at the national level.

In terms of environmental assistance, the government of Japan has long provided environmental assistance through Japan International Cooperation Agency (JICA)[10]. According to Mrs. Sadako Ogata, JICA President, the international cooperation of Japan through JICA's activities would continue to share knowledge and experience with developing countries and international cooperation in as wide as area as is as possible. Japan and JICA would attempt to encourage Japanese citizens to be involved in international cooperation with JICA in order to play a pivotal role at the global level.[11] Japanese environmental assistance in line with JICA cooperation through financial assistance, technical cooperation and technology transfer in the area of waste management is the main focus of this chapter.

In accordance with the government policy on waste disposal, JICA has provided support for measure related to the 3Rs by implementing solid waste management cooperation projects from the viewpoints of 1. assisting not only the central government but also local governments that are closer to the people; 2. improving services for urban residents, capitalizing on Japan's past experiences; and 3. reducing possibilities of public hygiene deterioration and environmental pollution from solid waste.

---

[10] The Japan International Cooperation Agency (JICA), which was established on 1 August 1974, was an official representative of the Japanese Government with the main responsibility being increasing technical cooperation with developing countries. From October 2003 onwards, JICA has become an independent administrative agency which coordinates ODA for the government of Japan.

[11] K M. "JICA Global Plaza," *The Japan Journal* 3 (July 2006): 3.

1. Financial Assistance

Financial resources are the significant factors to assist and allow environmental development. For developing countries, only the budget allocation for public utilities is insufficient to make a nationwide contribution. Therefore, it is impossible to supply for development and activities in the environmental field. Financial contribution from developed countries is crucial for assisting developing countries. Japan has mainly supported the promotion of environmental measures through Japanese Official Development Assistance (ODA). ODA has been counted the first area and channel of Japan to exercise her active foreign policy and role for being a major donor and leadership in the international community. Prime Minister Yasuhiro Nakasone paid special consideration on ODA policy. He initiated a large-scale expansion of ODA's budget.[12] Japanese ODA's utilization was originally aimed to provide for economic cooperation, social infrastructure development including human resource development and institution building. In order to cope with the new challenges in the current global environment, the government of Japan has taken a wider range of issues into consideration to determine the direction of Japan's ODA in the post-Cold War. According to the ODA Charter of June 1992, the issue of the environment is regarded as the first priority areas which need to be addressed in ODA principles. The government of Japan made the decision to take the initiative and cooperative efforts dealing with environmental issues through ODA since then.

In order to utilize ODA appropriately and effectively, Japan's Medium-Term Policy on ODA was formulated in August 1999 in line with the provision of the 1992 ODA Charter. Environmental conservation was specified as one of the primary measures and consideration for environmental assistances under this Medium-Term Plan on ODA 1999. Five years later, the 1992 ODA Charter and the 1999 Medium-Term Policy on ODA, on the basis statement of ODA, were reviewed and revised in August 2003 with the purpose of enhancing strategic value, flexibility, transparency

[12] Ministry of Foreign Affairs, Japan, "Diplomatic Bluebook 1987," http://www.mofa.go.jp/policy/other/bluebook/1987/1987-contents.htm#CONTENTS.

and efficiency of ODA including continuing to intensify environmental problems.[13] The new ODA Charter and new Medium-Term Policy on ODA were further enhanced to encourage Japan to play a more active role in the arena of international environment. The government of Japan has pushed a significant effort reforming her ODA to be more efficient and effective.

JICA has seemed to be the main agency sharing the responsibility for implementing ODA through which the Japanese government has provided the environmental assistance to other countries. The role of the Japanese ODA has been very important. In the area of international waste management after the Cold War, the government of Japan has provided financial support to many countries in terms of grant aid project through the actions of the JICA for handling with waste treatment (See Table 4.1).

[13] Ministry of Foreign Affairs, Japan, "Japan's Medium-Term Policy on Official Development Assistance (Provisional Translation)," http://www.mofa.go.jp/policy/oda/mid-term/policy.pdf.

Table 4.1

Japanese ODA Disbursement on Waste Management (Grant Aid)[14]

Year	Grant Aid Project
1991	Project for the Improvement of Garbage Collection Equipment in the City of Managua, Nicaragua (403 million yen)
1992	Urban Sanitary Equipment Project in Six Cities (Santa Cruz, Dl Alto, Oruro, Potosi, Talija and Trinidad) of Bolivia Phase II (2.87 billion yen) The Study for Integrated Management of Urban Solid Waste in Santo Domingo Metropolitan Area of Dominican Republic The Project for Improvement of the Solid Waste Management System in Vientiane, Laos Municipal Solid Waste Management of the Guatemala Metropolitan Area, Guatemala The Project for Waste Improvement for Karachi, Pakistan Solid Waste Management in Tegucigalpa, Honduras
1993	Improvement of Solid Waste Management in the Greater Amman, Jordan (504 million yen) Project for Improvement of Solid Waste Management for Bamako, Mali Project for Improvement of Solid Waste Management in Sana'a, Yemen Municipal Solid Waste management of the Asuncion Metropolitan Area of Paraguay
1994	Project for the Improvement of Solid Waste Management in Alexandria City, Egypt Phase I (Trucks, Equipment/ 1,161 million yen) Project for Improvement of Solid Waste Management for Djibouti Project for Improvement of Solid Waste Management in Aden, Yemen
1995	Project for Improvement of Solid Waste Management in Major Local Areas of Jordan (1.155 billion yen) Project for Improvement of Garbage Collection and Disposal in Rawalpindi City of Pakistan (681 million yen) Project for Improvement of Solid Waste Management in Alexandria City, Egypt Phase II (1,980 million yen) Solid Waste Management in San Salvador, El Salvador The Project for Improvement of Solid Waste Management in Callao, Peru Regional Solid Waste Management for San Salvador Metropolitan Area, El Salvador Rehabilitation of Collection and Treatment Facility for Solid Waste in Callao

[14] Original sources are: Engineering and Consulting Firms Association, Japan (ECFA); Japan International Cooperation Agency; Japan Society of Waste Management Experts; South Pacific Regional Environment Programme; United Nation Centre for Regional Development.

Year	Grant Aid Project
	City, Peru Project for Improvement of Waste Disposal Equipment in the City of Damascus, Syria Improvement of Solid Waste Management Project for Colombo Metropolitan Area, Sri Lanka
1996	Project for Improvement of Environmental Conditions in Quetta City, Pakistan (660 million yen) The Project for Improvement of Solid Waste Management System in Vientiane Urban Area , Laos (705 million yen) Project for the Improvement of Solid Waste Management in Alexandria City, Egypt Phase II (Compost Plant, Construction/ 900 million yen) Solid Waste Management for Vanuatu Solid Waste Management in Addis Ababa, Ethiopia Solid Waste Management in the Major Local Cities of Jordan The Project for Improvement of Garbage Collection and Disposal in Rawalpindi City of Punjab Province in the Islamic Republic of Pakistan
1997	Project for Improvement of Solid Waste Management in Alexandria City Phase II (Compost Plant, construction/ 1,080 million yen) Solid Waste Management in Tegucigalpa, Honduras Solid Waste Management Project for Colombo Metropolitan Area, Sri Lanka Rehabilitation/Expansion Project of Sewage Works in the Municipality of Chitungwiza, Zimbabwe
1998	Project for Improvement of Waste Management for Aleppo, Syria Solid Waste Management for the Metropolitan Area of Asuncion, Paraguay
1999	The Project for Improvement of Waste Disposal Equipment in the Palestinian Interim Self-Government Authority
2000	The Project for Urgent Equipment Supply for Waste Management in Hanoi City, Vietnam (896 million yen) Waste Management and Compost Program for Samoa
2002	Project to Grant Recycled Waste-Collecting Vehicles to Thimphu City, Bhutan (8 million yen)
2003	The Project for Improvement of Solid Waste Management in Xian City of China (1,323 million yen)

Year	Grant Aid Project
2004	Project for Industrial Waste Management, Brazil (153 million yen) The Project for the Improvement of Solid Waste Management in the Greater Amman of Jordan Phase II (743 million yen) Supplying Equipment for New Landfill Site of Madona – Ghabawi, Jordan Solid Waste Improvement for Marchand and its Environs (Saint Lucia Solid Waste Management Authority)
2006	The Project for the Improvement of Equipment for Solid Waste Treatment in Local Cities of Syria (583 million yen) Implementation Support for 3R (reduce-reuse-recycle) Initiative for a Sound Material-Cycle Society in Hanoi, Vietnam (470 million yen)

For instance, the government of Japan assisted Jordan by contributing her 1.555 billion yen of grant aid for Improvement of Solid Waste Management in Major Local Areas in 1995. This project mainly provided machinery and materials for garbage collection activities in local cities and communities with the aim of improving the living environment of local residents allowing hygienic conditions and healthy lives. There are ten project areas established for garbage disposal sites which are North Shuneh, Kufrinja, Humra, Madaba, Lajoon, Tafila, Al Akaider, Mafraq, Ma'an and Aqaba. Garbage collection machinery (12 compactors, 8 dumps trucks and 500 containers), machinery for using at final disposal sites (9 bulldozers, 4 wheel loaders, 3 dozer shovels, 4 excavators and 7 dump trucks) as well as maintenance equipment (3 vehicles for the transport of spare parts and various tools) were provided through grant aid by the Japanese government to ten project sites. There has been an improvement in garbage collection areas with increasing amount of garbage collected. The sanitary conditions and environment have improved.[15]

In the same year, the municipal area of Rawalpindi Pakistan, which had long encountered the problem of waste management, also received 681 million yen of the grant aid with the necessary equipments for garbage collection and disposal through the Project for Improvement of Garbage Collection and Disposal in Rawalpindi City. This project aimed to improve garbage collection system and sanitary conditions. The

[15] Japan International Cooperation Agency, *Annual Evaluation Report 2001* (Tokyo: JICA, 2001), pp. 366-367.

local people had participated in this project and workshop. People in the project area were satisfied with the improvement of garbage disposal and sanitary environment.[16]

Japanese grant aid in the area of waste management provided by JICA is in accordance with the ODA Charter[17] of Japanese government as the foundation of Japan's policies and assistance to help developing countries handle with the problem. Having continually emphasized the promotion of environmental measure through her ODA, Japan has recently become the world's largest contributor of ODA for environmental protection efforts[18], which is expected to grow continually. At the same time, Japan ODA contributions have long been an important policy instrument in fulfilling her international responsibility and role as well as improving her position in the international community. The disbursement of Japanese grant aid covering technical cooperation and technology transfer are the focus of the subsequent section.

2. Technical Cooperation

Financial assistance alone is inadequate as a tool for environmental development in developing countries, technical cooperation is also necessary. In the meantime, technical cooperation is one of the means Japan can promote its leadership in the area of environment as well. Following participation the Colombo Plan[19], Japan began to provide technical assistance since October 6, 1954. Technical assistance is the priority of Japan's ODA which has been carried out by JICA since its establishment in 1974.[20] Japan has shown her willingness to support the progress of the 3R Initiative through technical cooperation, which has been identified as one of the priority targets of Japan's ODA in the area of environment, in order to provide

[16] Japan International Cooperation Agency, "Outline of the Project," http://www.jica .go.jp/english/evaluation/project/expo/asarchives/14-4-45.html.

[17] Regarding ODA policy of Japan, it was officially formulated under the ODA Charter. The ODA Charter approved by the Cabinet on June 30, 1992, was a comprehensive statement and dundamental documtn of Japan's basic policy on ODA for 10 years.

[18] Miranda A. Schreurs, *Environmental Politics in Japan, Germany and the United States* (United Kingdom: Cambridge University Press, 2002), p. 2.

[19] The Colombo Plan was launched in 1950 for the purpose of facilitating economic and technical cooperation among countries in South Asia, Southeast Asia and the Pacific. The headquarters is located in Colombo, Sri Lanka.

[20] Government of Japan, *Urban Solid Waste Management II JFY 2006* (Tokyo: Japan, 2006).

technical knowledge and promote better awareness in recipient countries. The capacity development must be provided through technical assistance. Technical cooperation covers skill, knowledge and technology transfer to developing countries for social development. JICA has been supporting technical assistance for developing countries in order to strengthen their national capabilities in waste management.

Technical cooperation has consisted of 1) implementation of technical training; 2) the dispatch of Japanese experts and volunteers; 3) development study; and 4) appropriate Japanese technology transfer. Many developing countries have encountered the problem of waste but lacked of skilled and knowledgeable officials to deal with the problem. Having had long domestic experience with appropriate waste management, the Japanese government has been willing to share her experience with other countries through collaboration of JICA technical cooperation. The technical cooperation in the area of waste management has been launched continually to various countries (See Table 4.2).

In terms of technical training and cooperation, Japan has dispatched Japanese experts and members of the Japan Overseas Cooperation Volunteers (JOCV) in specific fields to disseminate knowledge, provide technical support and work with the local community in the recipient countries either in short-term or long-term period. In the field of waste management, Japan has dispatched many experts to developing countries for providing knowledge and practical improvement in order to deepen understanding, develop technical skills as well as enhance capacity development (See Table 4.3). Cooperation for human resources development has been provided through the dispatch of volunteers and the acceptance of technical training in order to create the qualified people who will lead developmental planning.

Table 4.2

Japanese Technical Cooperation Project on Waste Management[21]

Year	Technical Cooperation Project
1992	The Study for Integrated Management of Urban Solid Waste in Santo Domingo Metropolitan Area of Dominican Republic (1992-1996) Municipal Solid Waste Management of the Six Cities in Bolivia (1992-1998)
1993	Municipal Solid Waste Management of the Asuncion Metropolitan Area, Paraguay (1993) Improvement of Solid Waste Management in the Greater Amman, Jordan (1993-1995) Country-focused Group Training Course on Environmental Protection in Brazil (Waste Treatment/ 1993-1997) The Industrial Waste Project in Brazil (1993-2000)
1995	Industrial Waste Management Project in Brazil Solid Waste Management for Dar-es-Salaam City, Tanzania National Center for Environmental Research and Training Project (CENICA) in Mexico Rehabilitation of Collection and Treatment Facility for Solid Waste in Callao City of Peru (1995-1997) Project for Improvement of Solid Waste Management in Alexandria City, Egypt Phase II (1995-1997)
1996	Solid Waste Management in the Major Local Cities of Jordan (1996-1998)
1997	Solid Waste Management in Tegucigalpa, Honduras (1997) Evaluation of Solid Waste Management in Dominican Republic and Honduras (1997) Solid Waste Management Project for Colombo Metropolitan Area, Sri Lanka (1997-1999)

[21] Original sources are: Engineering and Consulting Firms Association, Japan (ECFA); Japan International Cooperation Agency; Japan Society of Waste Management Experts; South Pacific Regional Environment Programme.

Year	Technical Cooperation Project
1998	Waste Minimization Activities in Asia Industrial Waste Processing Technologies for Brazil Sewage Sludge Treatment/Disposal and Reclaimed Waste Water Reuse, Thailand (1998-1999)
1999	Solid Waste Management in San Salvador, El Salvador Urgent equipment supply for Waste Management in Hanoi The Study of Industrial Waste Water Population Control in the Arabic Republic, Egypt Phase I
2000	The Industrial Waste Management Project in Brazil Assistance for Solid Waste Management Improvement in Hai Phong City of Vietnam Introduction of a Plan for Composting of Livestock Waste and Domestic Waste in Tov of Mongolia The Project for Urgent Equipment Supply for Waste Management in Hanoi City, Vietnam (2000-2002)
2001	Study on Solid Waste Management at Local Cities in Lattakia Region, Syria Project on Establishment of Control Capacity of Industrial Wastewater and Waste in the Argentine Republic Technologies on Waste Treatment and Environmental Pollution Control, Tunisia (2001-2003)
2002	Technologies on Waste Treatment and Environmental Pollution Control Project to Grant Recycled Waste-Collecting Vehicles to Thimphu City, Bhutan Preparation for the solid waste management plan and transfer of composting technologies in Imus, the Philippines (2002)
2003	The Clean Dhaka Master Plan for Solid Waste Management, Bangladesh Waste Management Training Course for SPERP (2003-2004) The Safe Closure and Rehabilitation of Landfill Sites in Malaysia (2003-2004) Terminal evaluation of the industrial waste processing technology, Brazil (2003-2004) Improvement of the Stung Mean Chey Disposal Site, the Municipality of Phnom Penh, the Kingdom of Cambodia (2003-2004)

Year	Technical Cooperation Project
	Pilot Project for Sanitary Improvement of Manikarnika Ghat, India (2003-2005)
2004	Urban Waste Management for South American Countries Project on Establishment of Control Capacity for Industrial Wastewater and Waste of Argentina (Project for Technical Capacity Development for Industrial Wastewater and Waste Pollution Mitigation) The Study on Solid Waste Management for the Kathmandu Valley, Nepal (2004-2005) Solid Waste Management in Samoa (2004-2006) Study on National Waste Minimization in Malaysia (2004-2006)
2005	Environmental Protection and Management for Syria Training of 20 Personnel in Cooperation with Jordan (Solid Waste Management) The Project for Improvement of Solid Waste Management in the Republic of Palau (2005-2008)
2006	Urban Solid Waste Management II (2006) Comprehensive Waste Management Technique II in 2006 Waste Disposal Infrastructure and its Operation for the Countries South East Europe (2006) Implementation support for 3R (reduce-reuse-recycle) initiative for a sound material-cycle society in Hanoi, Vietnam (2006-2009) Solid Waste Management Project for the Pacific Islands region (2006-2010)
2007	Waste Management and 3Rs (Reduce, Reuse and Recycling) Policy Project for Strengthening of Solid Waste Management in Dhaka City, Bangladesh (2007-2010)

Table 4.3

Dispatch of Experts, JOVC, and Senior Volunteers for Waste Management

Fiscal Year	Middle East	Africa	Asia	Latin America	Europe	Pacific
1993				Guatemala		
1994				Argentina		
1995			China Thailand Philippines Indonesia	Argentina Paraguay		
1996			Maldives	Bolivia Argentina		
1997	Bahrain Morocco		Indonesia	Costa Rica		Samoa
1998	Tunisia					
1999			Philippines Laos Mongolia Indonesia Vietnam	Costa Rica Brazil		
2000	Saudi Arabia Tunisia	Kenya	Pakistan Laos Cambodia Indonesia Sri Lanka Bangladesh	Mexico Costa Rica Nicaragua Paraguay		Samoa
2001	Bahrain Turkey	Kenya	Thailand Laos	Paraguay Dominican Republic		Samoa
2002			Uzbekistan Pakistan Nepal Philippines	Cuba El Salvador Dominican Republic		Fiji
2003	Tunisia	Tanzania	Philippines Bangladesh Cambodia	Bolivia Costa Rica	Czech Republic Serbia Montenegro	

Source: JICA, 2005. Supporting Capacity Development for Solid Waste Management in Developing Countries.

JICA, on behalf of the Japanese government, has collaborated with the World Health Organization (WHO) and the South Pacific Regional Environment Programme (SPREP) to carry out a training course and programme on municipal solid waste management in Pacific Island countries from 2001 onwards for the purpose of improving proper health care waste management for five years in line with Miyazaki Initiative.[22] During 2001-2004, there were 52 people participating in the training course. The government of Japan decided to extend the training course for Pacific Island countries an additional five years starting from 2005 with cooperation between JICA and WHO. The Training Course in Municipal Waste Management has been held annually. Information and video related to waste management were provided during the course. The objective of this annual training course was aimed to improve the human resources' skills and knowledge about waste management through a regional information network and waste training courses.[23] JICA has continued to operate technical training to SPREP member countries[24] and Samoa on waste management through the Project of Solid Waste Management in Oceania Region from 2006-2010. This Project has been implemented as long-term assistance with the dispatch of Japanese experts on waste treatment, landfill management and human resource development.

The government of Japan has also provided training programs upon the request of developing countries in terms of dispatching experts through technical cooperation. The request for the dispatch of experts by the National Solid Waste Management Commission (NSWMC) of the Philippines in 2002, with the objective of

---

[22] The Government of Japan will consider making guidelines on measures against waste management, focusing on the Pacific Island countries, at "the South Pacific Regional Environmental Program Training Center". The center is scheduled to be constructed in Samoa, funded by Japan's Grant Aid. The Government of Japan will also consider conducting training programs on waste management, among other things, in Okinawa.

Ministry of Foreign Affairs, Japan, "Pacific Common Frontiers Initiative: Miyazaki Initiative," http://www.mofa.go.jp/region/asia-paci/spf/palm2000/palm-summit/seika /initiative.html.; World Health Organization, *Report Workshop on Health-Care Waste Management in Pacific Island Countries* (Philippines: WHO, 2003).

[23] Secretariat of the Pacific Regional Environment Programme (SPREP), *Solid Waste management strategy for the Pacific Region* (Samoa: Commercial Printers, 2006), p. 41.

[24] The focused group of this project are the Pacific Island Forum Countries Region which are Cook Islands, Federated States of Micronesia, Fiji, Kiribati, Marshall Islands, Nauru, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu.

promoting the new system of waste management in line with the Ecological Solid Waste Management Act of 2000[25], was approved by the government of Japan as an urgent case to handle with the problem of waste management. Japanese experts had been sent to NSWMC of the Philippines through JICA in order to provide technical and administrative advice regarding the issue of waste for 3 years as long-term development from November 2004 to March 2006.[26] Moreover, the manual and guidebooks were published as guideline to further handle with the problem of waste management in the Philippines.[27]

On the other hand, the acceptance of training participants has been carried out. Representatives from recipient countries have been invited to Japan as trainees for participating in the training course related to waste management. Training courses in Urban Solid Waste Management have been held annually in cooperation with the JICA and Global Environment Center Foundation (GEC) since 1992 (See Table 4.4). Practical activities and on-site visits to a recycling plants and waste disposal sites have been provided in the study areas of the training course. Japanese technical cooperation and training courses not only share knowledge, experience and ideas with many developing countries but also promote mutual understanding, information exchange and cooperation internationally.

[25] The Ecological Solid Waste Management Act of 2000 of the Philippines or Republic Act No. 9003, which was enacted by the Senate and House of Representatives, required the establishment of the National Solid Waste Commission (NSWMC) and appropriate system of solid waste management nationally. The fundamental system of solid waste management and techniques to cope with functional elements of ecological solid waste management such as generation, collection, storage, processing, transfer and transport and final disposal were address in the provisions of the act.

[26] *Japan Society of Waste Management Experts* 56 (April 2006).

[27] 'Guidebook for Safe Closer of Disposal Site', 'Technical Guidebook on Solid Waste Disposal Design and Operation' and 'National Solid Waste Management Framework' were published as an output of the Philippines.

Table 4.4

JICA Training Course on Urban Solid Waste Management in Japan

Fiscal Year	Nationality of Participants	Number
1992	China, Philippines, Thai, Egypt, Brazil, Peru	6
1993	Philippines, Brazil, Peru, Indonesia, Malaysia	5
1994	China, Philippines (2), Brazil, Indonesia, Malaysia, Maldives	7
1995	China, Philippines, Thai (2), Brazil, Indonesia	7
1996	China, Brazil, Indonesia, Maldives, Laos, Viet Nam, Kenya, Nicaragua	8
1997	China, Jordan (2), Bolivia, Chile, Kazakhstan	6
1998	Egypt, Bolivia, Cambodia, Nepal, Syria	5
1999	Brazil, Indonesia, Chile, Yemen, Tanzania	5
2000	China, India, Philippines, Ghana (2)	5
2001	China, Philippines, Thai, Egypt, Brazil (2)	6
2002	China, Cote d'Ivoire, Egypt, Malawi, Samoa, Sri Lanka (2)	7
2003	Cambodia, Costa Rica, Egypt, India, Indonesia, Jordan, Paraguay, Philippines, Senegal, Uruguay, Yemen	17
2004	Colombia, Jordan, Mongolia, Morocco, Papua New Guinea, Philippines, Thailand, Uruguay	8
2005	Chile, Dominican Republic, Lesotho, Mongolia, Morocco, Sri Lanka (3), Venezuela	9
2006	Bangladesh, Brazil, Colombia, Cambodia, Croatia, El Salvador, Ethiopia, Guatemala, India, Mali, Sri Lanka, Venezuela	12

Source: GEC, 2006. JICA Training Course by GEC

Moreover, the government of Japan cooperated with Kitakyushu International Techno-cooperative Association to organize the Country-focus Group Training Course in order to disseminate intensive information, waste management skill and treatment techniques. The Project of Country-focused Group Training Course on Environmental Protection in Brazil (Waste Treatment) from 1993-1997 was an example of Japanese assistance through technical training as well. This Training Course was implemented to provide knowledge related to waste treatment, practical skills, technological solution including industrial waste management to Brazilian technician and administrative officers for in depth understanding and further development in Brazil. According to the questionnaire conducted after the course, 95 percent of participants were satisfied with this training course.[28] Kitakyushu International Techno-cooperative Association has also promoted international technical cooperation in accordance with the 3R Policy of Japanese government. The government of Japan cooperated with a municipal community in Sao Paulo, Brazil assisting to establish a recycling center in 2002.[29]

At the end of 2002, there were 351 technical operation projects (the accumulated number of course participants). Trainees came from 57 countries in Asia, Central and South America, Middle East, Africa, Oceania as well as East Europe.[30] During 2003 to 2004, 13 technical training courses with oversea participants were operated in Japan. Information sharing and experience disseminated to developing countries through JICA's technical cooperation was very helpful.[31] Implementations of technical cooperation that were organized in Japan have provided good opportunities for participants to gain wider experiences regarding technology and ideas as well as to discuss and exchange information with participants from other countries.

---

[28] Japan International Cooperation Agency, "Country-focused Group Training Course on Environmental Protection in Brazil," http://www.jica.or.jp/english/evaluation/project/expo/la/archives/13-4-06.html.

[29] Ministry of Environment, Japan, "Ministerial Conference on 3R Initiative Tokyo-April 28-30, 2005: Draft Speaking Notes for Kiyo Akasaka," http://www.env.go.jp:80/earth/3r/en/info/03_02.pdf.

[30] *Japan Society of Waste Management Experts* 43 (January 2003).

[31] Japan International Cooperation Agency, "Circle of JICA Long-term Training Program Participants," http://www.jica.go.jp/english/scholarship/topic/circle_01.html.

Development study is one of the main categories of JICA's technical assistance for developing countries. JICA's development studies are a technical cooperation scheme, which is mainly conducted for a relatively short time period of about 2 years by a consultant team. JICA started to conduct development studies in the field of waste management in the early of 1980s. Master Plan Study (M/P), Feasibility Study (F/S) and Pilot Project (P/P) have been carried out as the part of a development study aiming to provide information and deepen understanding through capacity development as well as practical improvement of operation in solid waste programs. After the Cold War, the government of Japan has operated development studies for waste management in many countries (See Table 4.5).

During 1997-1999, for example, JICA had provided a development study of solid waste management by formulating the master plan and dispatching a pilot project in metro Manila through Development Study of Solid Waste Management in Metro Manila, the Philippines.[32] In the operation of a development study, a collection system improvement project was carried out to improve the collection method and process waste more effectively. Community-base recycling activities and recycling recyclable materials were both promoted through the workshops with participation of local authorities and residents. Furthermore, educational program and public relation activities related to waste management and environmental issue were conducted as environmental tour to provide information to high school students and teachers including a distribution of videotape to schools and teaching materials covering waste management education.

[32] Japan International Cooperation Agency, *Supporting Capacity Development for Solid Waste Management in Developing Countries: Towards Improving Solid Waste Management Capacity of Entire Society* (Tokyo: JICA, 2005), pp. 123-130.

Table 4.5

Development Study Project towards Waste Management in Developing Countries[33]

Year	Development Study Project
1991	Solid Waste Management in Vientiane, Laos (1991-1992) Solid Waste Management in Budapest, Hungary (1991-1993) Solid Waste Management for Poznan City, Poland (1991-1993) Municipal Solid Waste Management of the Guatemala Metropolitan Area (1991-1994)
1992	The Study on the Solid Waste Management System Improvement Project in Vientiane Solid Waste Management in Surabaya, Indonesia (1992-1993) Study on Solid Waste Management for Poznan City, Poland (1992-1993) Municipal Solid Waste Management of the Budapest City, Hungary (1992-1993) Solid Waste Management in Sofia, Bulgaria (1992-1994)
1993	Solid Waste Management for the Territory of the Sofia Grater Municipality, Bulgaria (1993-1994) Solid Waste Management for the Metropolitan Area of Asuncion, Paraguay (1993-1999)
1994	Solid Waste Management in Bucharest, Romania (1994-1995) Solid Waste Management System for the Bucharest Municipality, Romania (1994-1996) Wastewater and Solid Waste Management for the City of Ujung Pandang, Indonesia (1994-1996)
1995	Project for the Improvement of Garbage Collection Equipment in the City of Managua, Nicaragua Project Formulation Study on Future Assistance for Environment Management, China (1995-1996) The Master Plan Study on Industrial Solid Waste Management in the Metropolitan Santiago Region in the Republic of Chile (1995-1996) Improvement of Garbage Collection and Disposal in Rawalpindi City,

[33] Original sources are: Engineering and Consulting Firms Association, Japan (ECFA); Japan International Cooperation Agency; Japan Society of Waste Management Experts; South Pacific Regional Environment Programme.

Year	Development Study Project
	Pakistan (1995-1996) Project for Improvement Waste Disposal Equipment in City of Damascus, Syria (1995-1996) Improvement of the Solid Waste Management System in Vientiane Urban Area, Laos (1995-1997)
1996	Study on National Guideline for the Solid Waste Management for Morocco (1996-1997) The Study on Solid Waste Management in Nairobi City, the Republic of Kenya (1996-1998)
1997	Solid Waste Management Project Environmental Project Formation Study, Vietnam Waste Management Project for Bangkok, Thailand Study on Solid Waste Management for Dar-es-Salaam City, Tanzania Industrial Waste Recycling Plan in Tunisia (1997-1998) Development Study of Solid Waste Management in Metro Manila, the Philippines (1997-1999)
1998	The Study on Waste Management for 3 cities in Nicaragua The Study on Solid Waste Management for Mexico City (1998-1999) The Study on Environmental Management for Ha Long Bay, Vietnam (1998-1999) Sewage Sludge Treatment/Disposal and Reclaimed Wastewater Reuse (1998-1999) The Solid Waste Management for Male City in the Republic of Maldives (1998-1999) The Study on Solid Waste Management of the Urban Area of Tegucigalpa's Central District, Honduras (1998-1999) The Study on Regional Solid Waste Management for Adana and Mersin, Turkey (1998-2000)
1999	Study on Solid Waste Management for Metro Manila Solid Waste Management in Almaty City, Kazakhstan (1999-2000) The Study on Regional Solid Waste Management for San Salvador Metropolitan Area, El Salvador (1999-2000)
2000	Project formulation study (Industrial Wastes), the Philippines The Study on Environmental Improvement Project for Hanoi, Vietnam The Study on Solid Waste Treatment Plan at Local City in the Syrian Arab Republic

Year	Development Study Project
	The Study on Industrial Waste Management in Bangkok Metropolitan Area and its Vicinity in the Kingdom of Thailand Lumbini Urban Development, Nepal (2000-2001) Solid Waste Disposal in Yangon City, Myanmar (2000-2001) Study on Sanitation Improvement Plan for Hai Phong City, Vietnam (2000-2001) The Master Plan Study on Integrated Environmental Management in Baku City in Azerbaijan Republic (2000-2001) The Study on Industrial Hazardous Waste Management in the Republic of the Philippines Phase I (2000-2001) Study on Solid Waste Management at Local Cities of Syria (2000-2002)
2001	The Study on Waste Management for Niger, Mali The Study on Improvement of Solid Waste Management in Secondary Cities of Sri Lanka The Study on Industrial Hazardous Waste Management in the Republic of the Philippines Phase II Master Plan on Industrial Waste Management in the Bangkok Metropolitan Area and its Surroundings (2001-2002) Master Plan for Hazardous Waste Management in Romania (2001-2003) The Study on Solid Waste Management Plan for Municipality of Panama in the Republic of Panama (2001-2003)
2002	Study on Waste Management Planning in Dhaka, Bangladesh (2002-2003) Master Plan Study for Hazardous Waste Management in Romania (2002-2003) Waste Management Project for Recycling Household Waste , Panama (2002-2003) Waste Collection Improvement by Bell Collection with Public Cooperation in Sri Lanka (2002-2003) The Study on Improvement of Solid Waste Management in Secondary Cities in Sri Lanka (2002-2004)
2003	The Study on National Waste Minimization (Recycling) in Malaysia Integrated Management of Urban Solid Waste in Havana City, Cuba/ Comprehensive Planning Study on Urban Solid Wastes Management in Havana, Cuba Evaluation and Improvement of Eastern Black Sea Region's Urban Waste Management, Turkey Study for the Development of Waste Management System in Local Areas in the Kingdom of Thailand The study on Industrial Hazardous Waste Management in the Republic

Year	Development Study Project
	of the Philippines Phase II The Project for Establishment and Management of Appropriate Technology Center for Waste Water Treatment in Indonesia Project of the Study on Improvement of Solid Waste Management in Secondary Cities in Sri Lanka (Improvement of an Existing landfill Site and Establishment of a New Landfill Site in Sri Lanka) The Study on the Safe Closure and Rehabilitation of Landfill Sites in Malaysia (2003-2004) The Study on the Management of Sanitation Environment in the Coast of Quintana Roo State (2003-2004) The Study on Solid Waste Management in Dhaka City, Bangladesh (2003-2005) The Study on Solid Waste Management Improvement Project in the Municipality of Phnom Penh, the Kingdom of Cambodia (2003-2005) The Study on Solid Waste Management for the Kathmandu Valley, Nepal (2003-2006)
2004	Project for Industrial Waste Management, Brazil Integrated management of Urban Solid Waste in Havana City of Cuba Development Study on Solid Waste Management in Dhaka City, Bangladesh The Study on Solid Waste Management Improvement Project in Phnom Penh, Cambodia The Study of Management on Sanitation Environment in the Coast of Quintana Roo State, Mexico The Study for Integrated management of Urban Solid Waste in Santo Domingo, Dominican Republic The Study on Solid Waste Management for Ulaanbaatar Municipality, Mongolia (2004-2006) The Study on Integrated Master Plan for Sustainable Development of Siem Reap/ Angkor Town (2004-2006)
2005	Development Study on Integrated Solid Waste Management Plan in Santo Domingo de Guzman, National District, Dominican Republic Clean Dhaka Master Plan/ Green Dhaka Clean Dhaka, Bangladesh (2005-2006) The Study on the Safe Closure and Rehabilitation of Landfill Sites, Malaysia (2005-2010)
2006	Solid Waste Management Plan for the Port Vila Municipality, Vanuatu (2006)

It is very important to raise public concern, increase environmental awareness and deepen understanding of appropriate waste minimization and treatment. In this regard, human resource development and public education concerning waste disposal and recycling are crucial.[34] JICA has designed educational projects and programs about waste disposal and recycling to developing countries as a high priority in order to provide hygiene education and to promote public awareness. There have been 11 pilot projects which carried out by JICA covering hygiene education or awareness raising campaigns since 1991.[35] Environmental education and awareness building are self-help measure for further development. Education development is very important to foster and enhance human resources having an increased awareness on waste and appropriate waste treatment. The promotion of 3Rs and appropriate waste disposal has been addressed through educational programs.

In case of waste management in Sri Lanka, as the first example, JICA operated a development study in Sri Lanka during 2002-2003.[36] Environmental education on waste treatment remained a top priority of pilot project that JICA has aimed to provide knowledge about waste problems, waste treatment and to raise environmental awareness of local people for long-term development. In this regard, JICA established environmental education centers in local cities of Sri Lanka as the model cities of environmental education including Chilaw City, Matale City, Nuwara Eliya City and Budulla City where children and local people could learn about environment and waste management. Environmental information was created in the form of banners and leaflets at each environmental education center. Bampaha City launched a recycling campaign in schools to encourage students to learn and realize the importance of recycling activities such as waste sorting. The recycling systems have operated at many schools. The Ministry of Environment and Natural Resources of Sri Lanka in collaboration with JICA distributed picture books for waste education and teaching manuals to schools for children throughout the country. As a consequence of participation in recycling activities as well as environmental education workshops,

[34] Interview with Asst. Prof. Dr. Kampol Ruchiwit, Director of Institute for Continuing Education and Social Services and Professor of the Faculty of Allied Health Sciences, Thammasat University, 9 February 2007.

[35] Japan International Cooperation Agency, "Supporting Capacity Development," pp. 89-92.

[36] Ibid., pp. 142-154.

teachers and students have an increased awareness regarding understanding waste treatment.

For the second example, the government of Japan additionally approved to assist Dhaka City of Bangladesh to improve solid waste management from 2003 to 2005 according to the Study on Solid Waste Management in Dhaka City, Bangladesh.[37] The Study was designed to formulate a master plan and develop human resources in line with technology transfer concerning solid waste management in Dhaka City with the technical assistance of JICA. The master plan for Dhaka City was planned for a ten year period handling domestic, industrial and medical waste. During 2003 to 2005, JICA conducted the Clean Dhaka Master Plan Study for comprehensive improvement of the waste situation in Dhaka City. The main objectives of the Clean Dhaka Master Plan were: 1) to establish special organization and encourage local people to change their behavior of waste treatment and collection including to develop collection system of waste in the community; 2) to improve the future composition of collection/transportation as well as the collection equipment/system with the involvement of Dhaka City Cooperation; 3) to improve landfill operation by reconstructing the current landfill site into a sanitary landfill site and; 4) to strengthen capability of Dhaka City Cooperation in waste management. The aim was to develop the capabilities and management skills of human resource of Dhaka City Cooperation, JICA sent two people of JOCV to Dhaka City Cooperation to closely cooperate with Dhaka City Cooperation officials. The JOCVs are still working with officials and residents in Dhaka City in order to raise awareness and concerns about environmental and waste management issues in community. According to Mr. Sadeque Hossain Khoka, the Mayor of Dhaka, the Clean Dhaka Master Plan of JICA was a significant project for Dhaka City to solve the waste problem in Bangladesh. After implementation of the Clean Dhaka Master Plan, waste management and waste collection in Dhaka City has been improved in a positive way. The behavior and attitude of local residents and officials related to waste management has changed. People have had a greater awareness on the problem of waste as well as

[37] *Japan Society of Waste Management Experts* 54 (October 2005).

realized the important roles and responsibilities regarding handling waste treatment.[38] Presently, the master plan regarding solid waste management, which was implemented by JICA, is being applied in common practice in the Dhaka City Cooperation.[39]

The JICA budget for technical cooperation on waste management has increased every year. In this area, JICA provided 886 million yen for FY1999 as well as 872 million yen and 1,200 million yen for FY2000 and FY2001 respectively.[40] Over the past 10 years, the government of Japan has carried out many types of project through JICA cooperation which include 36 development studies, 29 grant aid projects, 75 expert dispatches, 27 volunteer dispatches. Moreover, 13 in-countries training courses and 3 third-country training courses were organized by JICA during 2002-2003.[41]

Transfer of technology and know-how is regarded to be part of Japanese technical assistance. Today Japan is notable as one of the most advanced countries in science and technology. Many of Japan's technologies in the environmental field are the most advanced in the world.[42] Japanese domination in the purchase and production of environmental technologies and services has been very influential.[43] Japanese technology is one of the most significant instruments to help recipient countries to improve their environmental conditions. The government of Japan has carried out technology transfer in line with JICA's development studies. Technology transfer has been operated by Japanese experts and JOCVs.

For instance, Japanese cooperation on waste disposal with Pacific Island countries was implemented in accordance with Japan's commitment at the second Japan-Pacific Leaders Meeting (PALM 2000)[44] on the environmental cooperation

---

[38] Japan International Cooperation Agency, "Creating a Clean Capital," http://www.jica.go.jp/english/interview/2006_06.html.

[39] *Japan Society of Waste Management Experts* 54 (October 2005).

[40] *Japan Society of Waste Management Experts* 44 (April 2003).

[41] Mitsuo Yoshida, "Dissecting Technical Cooperation in Solid Waste Management from a Capacity Development Perspective," *Technology Development* 19 (January 2006): 5-13.

[42] Ministry of Environment, Japan, "Annual Report on the Environment in Japan 2004," http://www.env.go.jp/en/w-paper02/2004/full.pdf.

[43] Schreurs, p. 3.

[44] The Second Japan-Pacific Leaders Meeting (PALM 2000) was held in Miyazaki City, Miyazaki Prefecture on April 22, 2000 with participation of Japan and the 16 South

between Japan and Pacific Island countries on improvement of solid waste management. The involvement of Japan in PLAM aimed to assist the Pacific Island's governments to improve and develop waste management. The problem of waste has been an urgent problem of environment in Pacific Island countries due to urbanization and economic development. Lifestyles in Pacific Island countries have changed with high degree of waste. Japan started the Workshops for Municipal Solid Waste Management for the Pacific Island countries in 2001 through JICA at Okinawa Training Center and the SPREP Training and Education Center in Samoa. In addition, technology for waste management was transferred to countries in the Pacific Island to help solve the waste problem. For example, at a waste disposal site in Samoa, the Tafaigata, has been used for more than ten years without appropriate management. The government of Japan introduced the Fukuoka Method[45] (the semi-aerobic landfill method) as Japan's disposal technology to Samoa through dispatch of technical cooperation experts from JICA with collaboration of SPREP[46] in 2002. The main purpose of this project was 1) systematic development of good management and practices; 2) demonstration of waste minimization; 3) incremental improvements to landfills; and 4) annual regional workshops on municipal solid waste management. The transfer of Fukuoka Method to Samoa created a hygienic landfill method and has achieved success.[47] The Fukuoka Method of Japan has drawn attention from other

---

Pacific member countries. During the Meeting, Prime Minister Yoshiro Mori declared Miyazaki Initiative aiming to support sustainable development, cooperate in global issues of concern and to strengthen partnership between Japan and countries in South Pacific. Regarding topic of environment, waste management was emphasized that "The Government of Japan will consider making guidelines on measures against waste management, focusing on the Pacific Island countries, at the South Pacific Regional Environmental Program Training Center. The center is scheduled to be constructed in Samoa, funded by Japan's Grant Aid. The Government of Japan will also consider to conduct training programs on waste management, among other thins in Okinawa."

Ministry of Foreign Affairs, Japan, "Pacific Common Frontier."

[45] The Fukuoka landfill method was originally a semi-aerobic sanitary landfill structure jointly developed by cooperation between the Faculty of Engineering of Fukuoka University and the Fukuoka City. The structure of the Fukuoka landfill method is simple and can be built from low-cost materials available in developing countries such as bamboo, oil drums and coconut leaves.

[46] The South Pacific Regional Environment Programme (SPREP) is an intergovernmental organization established in 1982 by the governments and administrations of the Pacific region with the purpose of protecting and managing of environment and natural resources as well as ensuring sustainable development.

[47] *Japan Society of Waste Management Experts* 51 (January 2005).

island countries seeking better solutions to waste management. JICA later established the Recycling Center in Samoa in 2003 together with the Campaign of Waste Awareness and Education. The 3Rs concept in Samoa has been promoted and emphasized. In order to provide further support towards the issue of waste management, the government of Japan has continued to assist Pacific Island countries to improve and develop waste management through the Okinawa Initiative which was declared during the Third Japan-Pacific Islands Forum (PIF) Summit Meeting organized in Okinawa 2003.[48] The Okinawa Initiative: The Regional Development Strategy and Joint Action Plan for a More Prosperous and Safer Pacific was issued as Japan's initiative for supporting the development of regional solid waste management. According to the statement of ex-Prime Minister Junichiro Koizumi, the waste management was a priority and the focus of the agenda meeting.[49] The topic of waste management has been regarded as 'one of the most urgent but difficult issues in the Pacific'. Island governments agreed to develop and implement national waste management policies, encourage and support 'appropriate waste minimization activities' and 'establish and upgrade waste disposal facilities… that comply with minimum agreed regional performance standards'.[50] The Seminar on Comprehensive Solid Waste Management for Pacific Island countries was held by JICA at Okinawa International Center in 2003. This new technology for waste management has been further developed by Japan for utilization in other island countries where the Fukuoka Method is not suitable through cooperation between Japan and PIF. In addition, JICA

[48] With regard to Joint Action Plan of the Okinawa Initiative: Regional Development Strategy for a More Prosperous and Safer Pacific focusing on issue of waste management, the Government of Japan declared to support PIF members as following:

1. Development of regional strategy for waste management by South Pacific Regional Environmental Programme (SPREP) and other regional organizations;
2. Technical cooperation activities designed to enhance PIF members' capabilities; and
3. Funding for waste disposal facilities in line with the regional strategy.

Ministry of Foreign Affairs, Japan, "The Pacific Leaders Summit Between Japan and Members of the Pacific Island Forum," http://www.mofa.go.jp/region/asia-paci/spf /palm2003/outcome-3.html.

[49] Official Website of Prime Minister of Japan and His Cabinet, "Speeches and Statement by Prime Minister: Joint Press Conference at the end of the Japan-Pacific Islands Forum (PIF) Summit Meeting (PALM 2003)," http://www.kantei.go.jp/foreign /koizumispeech/2003/05/17kyodo_e.html.

[50] Floyd K. Takeuchi, "PALM Summit: Pacific Leaders Commit to Joint Action Plan with Japan," *Pacific Magazine* (17 May 2003).

organized environmental tour for secondary schools to the Tafaigata landfill site in Samoa during September and October 2005 with the support of the Kokusai Kyoryoku Campaign and cooperation with SPREP to enhance environmental awareness and to gain understanding of environment issues including the waste treatment through the 3Rs concept. The Workshops for Municipal Solid Waste Management and training have been continually operated with participation of trainees from many Pacific Island countries. Environmental Task Force has been carried out by JICA between 2005 to 2007[51] as well as waste management plans and workshops in each Pacific Island country have implemented the programs on schedule between 2006 to 2008.[52]

Japan is now emphasizing environmentally sustainable development technologies in her foreign aid programs. Transfer of know-how and environmentally-friendly technologies is essential for successful 3Rs.[53] The Ministerial Conference on the 3R Initiative addressed that the development of suitable technologies to deal with waste management is an urgent priority for 3Rs. 3R-related technologies can be divided into 3 categories: 1) recycling-related; 2) eco-design; and 3) new technologies.[54] Japan's experiences and advanced technologies can play a significant

[51] Embassy of Japan, New Zealand, "Five Target Areas," http://www.nz.emb-japan.go.jp/samoa/Five_target_areas.pdf.

[52] Fukuoka City Institute for Hygiene and the Environment, "Oceania Waste Management Project," http://221.114.113.155/samoa/TOR2/TOR-E.htm.

[53] Ministry of Environment, Japan, "The Role of the Basel Convention in Promoting 3Rs," http://www.env.go.jp/earth/3r/en/info/04_01.

[54] Recycling-related technologies (Technologies for the minimization, recycling, recovery and treatment of wastes)

This category includes specific recycling technologies for specific waste products that combine several elemental technologies and comprehensive system technologies. These are applied to recycling and remanufacturing of multiple types of wastes and waste products in joint treatment facilities or recycling centers established with public assistance.
Many of these technologies are labour-intensive and relatively low-cost. In particular, the promotion of the 3Rs in developing countries usually requires basic technologies to enable volume reduction and the sorted treatment of wastes, including "shedding, screening, washing, drying, dehydrating" and/or other basic technologies, prior to the use of such technologies, the sorted collection recyclable wastes and other general wastes is required.

Eco-design technologies

Eco-design technologies include those that enable reduction in materials, production technology of easily recyclable materials, product design technologies that facilitate reuse of products easily by upgrading performance and manufacturing technologies for easier disassembly. The latter deals with separation and screening of products to enable reuse and recycle and related to industrial processed with minimal waste generation and a low

role to handle with the problem of waste in developing countries by promoting the use of environmentally friendly and advanced technologies. According to Japan's Action Plan for a worldwide sound material-cycle society, it articulated that;

> "Japan is in a position to, through dissemination of its own experience and technologies to the world, support capacity building of developing countries and regional/global international cooperation and take a leadership role in international efforts to establish a sound material-cycle society on the 3Rs even as it strengthen its domestic efforts towards the establishment of such a society."[55]

Japan's cooperation and contributions to global environmental issues shows a positive trend of acceptance from the international community. The government of Japan has made an active contribution in the area of waste management to developing countries in order to enable people to have the self-help efforts and to strengthen capacity improvement for long-term development. Japanese environmental assistance benefits the environment in developing countries.[56] Involvement of Japan reflects her potential to assist developing countries to improve waste management. The role of Japan in helping developing countries through ODA, technical cooperation as well as

---

level of hazard, such as cleaner production and clean technologies. In most cases, they are developed by individual manufacturers, and apply to their in-house processes and specific products. To make use of such technologies, the payment of license fees is usually required. Cleaner production and eco-friendly design technologies have been developed and are applied in most developed countries and some developing countries. However, the level of commitment varies according to the company.

New technologies

New technologies include biotechnology, nanotechnology and information technology. Application of these technologies is expected to result in new kinds of proposals for technological systems promoting the 3Rs.

Ministry of Environment, Japan, "Issue Paper: Senior Officials Meeting on the 3R Initiative," http://www.env.go.jp/recycle/3r/en/s_officials/06/pdf.

[55] Ministry of Environment, Japan, "Japan's Action Plan For a World-Wide Sound Material-Cycle Society through the 3R Initiative," http://www.env.go.jp/earth/3r/en/approach/01.pdf.

[56] Interview with Asst. Prof. Dr. Kampol Ruchiwit, , Director of Institute for Continuing Education and Social Services and Professor of the Faculty of Allied Health Sciences, Thammasat University, 9 February 2007 and Dr. Yongsak Kachonpadungkitti, Vice Dean for Academic Affairs of the Faculty of Sciences and Technology, Thammasat University, 31 January 2007.; Official Government News Portal of Sri Lanka, "Minister Seeks Japanese Assistance for Solid Waste Management Program," http://www.news.lk/index2php?option=com_content&task=view&id=3425&Itemid=44.; Institute for Global Environmental Strategies, "Economic and Social Commission for Asia and the Pacific," http://www.iges.or.jp/kitakyushu/mtgs/network/kin2/Documents/Presentations%20and%20Papers%20(FROM%20MEETING)/15%20October/1.%20Opening%20Session/ESCAP.pdf.; Japan International Cooperation Agency, "Circle of JICA Long-term."

technology transfer towards waste management has been useful and supportive in line with the 3Rs Initiative on international cooperation for promotion of 3Rs.

Environmental issues disregard national boundaries. The impact of environmental problems spreads all over the world. In an effort to overcome the problem internationally, international cooperation and collaboration is vital for all to help find solutions together. International participation and cooperation have become a key characteristic of global sustainable development. Building a recycling-oriented society worldwide, Japan believes that one person or one country cannot change anything. It is important to promote the 3R Initiative through regional and international cooperation. In the area of waste management, close integration is required to further the improvement of 3Rs at the global level. When the formation of a sound material-cycle society is progressing, understanding, participation and cooperation among countries are essential in building a recycling-based society worldwide. The aforementioned organizations became important channels for Japan to play a significant role in promoting the 3Rs in order to strengthen the mutual collaboration and progress internationally. Cooperative movement and activities on the international stage can be easily seen and heard around the world.

The cooperative role of Japan towards the issue of waste has progressively performed significant involvement internationally. The government of Japan has presented her potential movement in collaboration with Basel Convention, APFED, WTO, SPREP as well as GEC through workshops and activities related to waste disposal. Environmental assistance from Japan is crucial support for helping developing countries dealing with the waste management. In addition, international engagement of Japan on the international stage has widely been observed.

The ODA of Japan has been recognized as the promotion of Japan’s national interest by maintaining her presence and prosperity. Japanese technical skills, know-how and technology transfer are crucial advantages for international contribution in the environmental field. The government of Japan has shown her strong determination and pushed her effort to help developing countries handling the problem of waste management. However, Japanese assistance should be applied to meet the needs of each recipient country due to the differences in the way of life, the root causes of the problem, circumstance, national policy and cultures in each country. The problem of

waste is universal but there is no universal solution. Japan needs to work closely with the local communities in order to understand the problems and to find the proper solution for each area. The implementation and development of policy for recipient countries are a big challenge. It would be successful if legislation is implemented on the right track while the authority and people must be ready to follow the law. Regarding Japanese technological resources, it should suit the needs of each recipient country. According to JICA, appropriate technologies can be summarized as "technologies that contribute to problem solving even to a limited extent within the constraints of the city or the country concerned."[57] Sometimes technology transfer form developing countries is unproductive. Sophisticated technology and the expensive cost of machinery maintenance become big problems for the recipient country. The government of Japan should help the recipient country learning to develop an appropriate technology which is useful for their communities for sustainable development by themselves.[58] Environmental education and human resource development along with participation of local authorities and communities in each area are the good points and Japan's crucial assistance to raise environmental awareness and knowledge of local people extensively in order to create self-help effort in long-tem development.

In accordance with realism, all nation-states are motivated by national interests. All states consider survival of the fittest and the struggle for power which is motivation of human beings. According to Machiavelli, the leader of a state must do whatever is necessary to protect his power and the interest of state.[59] Human nature generally desires to gain an advantage over other and to avoid domination by others. The government of Japan has exercised her foreign policy toward environmental issues as the means to increase her international role. The issue of waste treatment in Japan is set as the high priority at both domestically and internationally. Japan's achievement to overcome the problem of waste at home is recognized to motivate

---

[57] Japan International Cooperation Agency, "Supporting Capacity Development," p. 155.

[58] Interview with Asst. Prof. Dr. Kampol Ruchiwit, Director of Institute for Continuing Education and Social Services and Professor of the Faculty of Allied Health Sciences, Thammasat University, 9 February 2007.

[59] Dean A. Minix and Sandra M. Hawley, *Global Politics* (the United States: Wadsworth Publishing, 1998), p. 60.

Japan to show her potential as a leadership to other countries. Japanese environmental assistance through financial support, technical assistance and technological capability is perceived as the significant tool to pursue her national interest. It is undeniable that international cooperation and environmental assistance from Japan in the area of waste management has brought positive benefits to Japan and recipient countries mutually. The Japanese experience on domestic waste treatment has been disseminated to other countries. Information exchange is very useful to apply for further development and achieve the 3Rs across countries. Developing countries can learn from the actual experiences of developed countries. The support of Japan has enhanced the capacity development and enabled developing countries to appropriately manage the problem by themselves so as to improve the spread of waste management expertise in the international community more efficiently and systematically. Mutual understanding among countries will become deeper. In the meantime, providing environmental assistance to developing countries serves Japan's own interest as a significant actor and to showcase her expertise. International cooperation and environmental assistance through JICA movement can provide Japan many ways to share experiences and knowledge to handle with waste management worldwide. More importantly, international contribution and cooperation in environmental fields are an important means for the government of Japan to achieve her national interests and preferences and to assert herself as an international environmental leadership.[60]

[60] Interview with Asst. Prof. Dr. Kampol Ruchiwit, Director of Institute for Continuing Education and Social Services and Professor of the Faculty of Allied Health Sciences, Thammasat University, 9 February 2007 and Dr. Yongsak Kachonpadungkitti, Vice Dean for Academic Affairs of the Faculty of Sciences and Technology, Thammasat University, 31 January 2007.