

Collaboration between
Asia and the City of Kitakyushu

Actions for a Sustainable Society



IGES Discussion Paper

Actions for a Sustainable Society

– Collaboration between Asia and the City of Kitakyushu –



Institute for Global Environmental Strategies
City of Kitakyushu

Foreword

This year marks the 20th anniversary of the establishment of the Institute for Global Environmental Strategies (IGES). In 2019, the IGES Kitakyushu Urban Centre (formerly, the Kitakyushu Office) will also celebrate its own 20th anniversary since its doors first opened. The Kitakyushu Urban Centre has been raising its level of international recognition by engaging in practical research to contribute to the promotion of sustainable urban development in the Asia-Pacific region through collaboration with the City of Kitakyushu, which already made a name for itself in the field international environmental cooperation in the 1980s. I would like to express my deepest gratitude to everyone involved, including the City of Kitakyushu, who has offered us their unshakeable support and encouragement.

With the adoption and entry into force of the Paris Agreement and Sustainable Development Goals (SDGs), eyes are turning once again to the efforts of sustainable cities. Taking this as an opportunity, we investigated and analysed the factors that enabled Kitakyushu to conduct continuous cooperation activities in diverse areas based on case studies of cooperation with five cities in Asia (Dalian, Phnom Penh, Surabaya, Hai Phong, and Mandalay) and a focus on the intercity cooperation schemes that Kitakyushu has been involved in for almost 40 years. The results of these studies and analyses have been compiled to produce this report. I have high hopes that this book will be helpful for anyone who is currently engaged or considering becoming involved in intercity cooperation.

This year marks the milestone of Kitakyushu's 55th year since its incorporation as a municipality. The history of Kitakyushu during this 55-year period was a story of international environmental cooperation utilizing the framework of city-to-city collaboration. Developed under a framework and through partnerships with various stakeholders in the city, national government of Japan and overseas, Kitakyushu's popularity is a direct result of its strengths that have become assets for the city. The challenge to create a decarbonized and sustainable society has only just begun, and the international community is working together, irrespective of its status as a developing or developed country. There are many cities throughout the world seeking the knowledge and expertise found in Kitakyushu, which advocates itself as a "World Capital of Sustainable Development". The Kitakyushu Urban Centre will continue its work to contribute to the development of a sustainable society in Asia by promoting practical policy research with the collaboration of various stakeholders in and outside of Kitakyushu, including the Kitakyushu City government. I appreciate your continued and generous support even as we move beyond these milestones.

July 2018



Hiroyuki Kage

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Acknowledgments

The authors would like to express their gratitude to Mr. Hideo Naito, IGES Senior Fellow, who cooperated in the interview surveys, Mr. Reiji Hitsumoto, Administrative Director of the Global Promotion Department of The University of Kitakyushu, who offered valuable feedback during the review process, and all of our colleagues in and outside of IGES, including Kitakyushu City government officials, and Mr. Hideyuki Mori, IGES President, for their kind cooperation in making this report possible.

Refusal

Several documents and literature cited in this report do not have official English titles. The authors have provided tentative translations into English for ease of understanding. These titles may differ from official titles in Japanese. When quoting, please do not use these titles to indicate the official titles of these documents and literature.

Abbreviation & Acronym

ADB	Asian Development Bank	JICA	Japan International Cooperation Agency
AFD	Agence Française de Développement	KITA	Kitakyushu International Techno-cooperative Association
ASEAN	Association of Southeast Asian Nations	LDC	Least Developed Country
BOP	Base of the Economic Pyramid	MCDC	Mandalay City Development Committee
CCAC	Climate and Clean Air Coalition to Reduce Short-Lived Climate Pollutants	MONREC	Ministry of Natural Resources and Environmental Conservation, Myanmar
CCET IGES-UNEP	IGES Centre Collaborating with UNEP on Environmental Technologies	NDCs	Nationally Determined Contributions under the Paris Agreement
CLAIR	Council of Local Authorities for International Relations	NGO	Non-governmental Organization
DHSHD	Department of Human Settlement and Housing Department, Myanmar	NPO	Nonprofit Organization
ESC	Environmentally Sustainable Cities	ODA	Official Development Assistance
ESD	Education for Sustainable Development	OECD	Organisation for Economic Co-operation and Development
GCUS	Japan Global Center for Urban Sanitation	PDAM	Public Water Utility of Surabaya
GDP	Gross Domestic Product	PPWSA	Phnom Penh Water Supply Authority
GEGG	Myanmar on Green Economy Green Growth Forum	SDGs	Sustainable Development Goals
IGES	Institute for Global Environmental Strategies	UNCED	United Nations Conference on Environment and Development (Earth Summit)
JAIF	Japan-ASEAN Integration Fund	UNEP	United Nations Environment Programme
JBIC	Japan Bank for International Cooperation	UNEP-IETC	United Nations Environment Programme, International Environmental Technology Centre
JCM	Joint Crediting Mechanism	UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific
JETRO	Japan External Trade Organization		

Chapter 1

Introduction



Introduction

In recent years, international commitments such as the Paris Agreement and the Sustainable Development Goals (SDGs) have been adopted and come into force with the participation of all countries on an equal playing field without distinguishing between developed and developing countries. Countries have announced policies for countermeasures as a form of Nationally Determined Contributions (NDC) or Voluntary National Reviews (VNR) to contribute to the achievement of the goals of each commitment and are approaching the stage of implementing concrete actions while taking into account the socioeconomic situation of the region. In this environment, local governments have become important actors in the embodiment and implementation of national policies and measures. However, in developing countries in Asia, the actions of cities are not sufficiently advanced because their position is not clearly stated in national policies that have been developed based on such international agreements or the capacity of local governments is not sufficient. Although the positioning of cities in national policies depends on the intention of the national governments, international cooperation based on city-to-city collaboration (or intercity cooperation), where practitioners exchange information and ideas directly, is considered to be an effective approach in response to the capacity shortage of local governments.^{1,2} Movements to promote intercity cooperation have spread after entering the 'era of the city' as sparked by the Earth Summit. Today, intercity cooperative activities have started to attract attention once again, as international trends are taken into account.

Cities in Japan have also initiated international environmental cooperation activities through city-to-city collaboration. However, cities voluntarily commit to these actions by taking into account national policies, the intentions of stakeholders including mayors, and the socioeconomic situation of an area, for example, because international cooperation activities at the local government level are not legally binding. In particular, there are many cities that are unable to take the first step

to initiate cooperation with cities in developing countries because the benefits to its own residents are not clear.³ Even in this situation, a fair number of local governments, including Yokohama, Kawasaki and Osaka, have actively develop intercity cooperation activities. However, it is no exaggeration to say that Kitakyushu has become a top player in intercity cooperation in Japan in terms of the number of cooperating cities and target areas, length of cooperation periods, and from the perspective of international recognition. As a government-designated city with a population of approximately one million, how did Kitakyushu, just a local city situated far from the capital of Tokyo, become a key player in intercity cooperation?

This report looks to organize information from the perspective of how Kitakyushu launched intercity cooperation activities, and continued, expanded and intensified these activities. Chapter 2 provides an overview of Kitakyushu and background information on the city's commitment to intercity cooperation. Chapter 3 spotlights case studies on intercity cooperation with five Asian cities (Dalian, Phnom Penh, Surabaya, Hai Phong and Mandalay). Chapter 4 summarises the factors of how Kitakyushu has continued, expanded and intensified its intercity cooperation activities and how they have achieved top-runner status. Future developments in intercity cooperation are also discussed.

In Japan, the Cabinet decided on the Fifth Environmental Basic Plan indicating the basis of the nation's environmental policies for the next five years in April 2018. The Basic Plan clearly stipulates that intercity cooperation should be promoted by making full use of the know-how of local governments as support for developing countries. Therefore, there are high expectations for the contribution of local governments in this field. It is expected that the number of cities, which are facilitating cooperative activities now more than ever with cities that are already cooperating with each other and committing to the development of new intercity cooperation partnerships, will increase in number with hints from the case of Kitakyushu.

Box 1. What is intercity cooperation?

Intercity cooperation can take various forms. In this report in particular, intercity cooperation refers to international environmental cooperation and international environmental business activities carried out and facilitated by the Kitakyushu City government in a leading role through city-to-city collaboration with cities mainly in Asia and in partnership with various stakeholders in Kitakyushu in order to help improve environmental conditions in these cities.

1 United Nations Centre for Human Settlements (Habitat). City-to-City Cooperation: Issues Arising from Experience. Nairobi, 25 May 2001.

2 United Nations Centre for Human Settlements (Habitat). Report of the First Session of the World Urban Forum. Nairobi, 29 April – 3 May 2002.

3 Nagisa Ishinabe. Analysis of international city-to-city cooperation and intercity networks for Japanese national & local governments. IGES Discussion Paper. March 2010.

Chapter 2

Kitakyushu as a “Top-runner of Intercity Cooperation”



Kitakyushu as a “Top-runner of Intercity Cooperation”

1 Overview of Kitakyushu

Kitakyushu is one of 20 ordinance-designated cities¹ in Japan with a population of 960,000 in a city area of 492 km².² Major industries include the service, manufacturing and wholesale/retail industries, and total regional production is JPY 3.5 trillion.³ The city is located at the northernmost tip of Kyushu Island. The north side of the city faces the Kanmon Strait and the Hibikinada (Japan Sea), and the east side faces the Suonada (Seto Inland

Sea). Kitakyushu has flourished as a key hub of sea and land transportation, as it is located at the intersecting point between the Japan Sea, Seto Inland Sea, and Pacific Ocean, as well as Kyushu and Honshu. Major cities like Tokyo, Seoul and Busan in South Korea, and Dalian and Shanghai in China are located within a 1,000-km radius area. Due to its advantageous geographical location, Kitakyushu has carried out exchange with foreign countries since ancient times (Figure 2.1). Today, such exchanges play an important role in Kitakyushu’s development, as Asian liners arrive and depart from Kitakyushu Airport and Kitakyushu Port, which has been selected as a key base on the Japan Sea.⁴



Figure 2.1. Location of Kitakyushu Source: Kitakyushu City Corporate Location Guide “Introduction to Kitakyushu City”

1 Ordinance-designated city refers to a city with a population of 500,000 or more designated by a Cabinet Order pursuant to Article 252-19 Paragraph 1 of the Local Autonomy Act. Special provisions that differ from other general cities are stipulated for (1) administrative allocation, (2) involvement, (3) administrative organization, and (4) finance. (Source: Ministry of Internal Affairs and Communications)

2 City of Kitakyushu. “Kitakyushu City Statistical Yearbook” (accessed on April 2, 2018)

3 City of Kitakyushu. “2014 Public Economic Calculations of Kitakyushu City”

4 In November 2011, the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) of Japan selected base ports on the Japan Sea in order to incorporate the economic development of neighbouring countries into the growth of Japan and also contribute to the construction of a disaster-resilient logistical network, taking into account the country’s experience with the Great East Japan Earthquake, through the selection of functions to be expanded, concentration of measures and cooperation among the ports. Kitakyushu Port was selected as one of five comprehensive base ports in Japan. (Source: MLIT)

Kitakyushu was created in 1963 with the merger of five cities: the harbor and railroad hub of Moji; the castle town of Kokura; Tobata and Wakamatsu, the destinations of coal shipments from the Chikuhō coal fields; and Yahata, which flourished as an industrial city with the establishment of government-owned Yawata Steel Works in 1901. In the first half of the 20th century, Kitakyushu grew steadily as a steel manufacturing city, making significant contributions to the development of the Japanese economy. However, the city faced a diverse set of challenges in the process of development, such as serious air and water pollution. In the 1970s, the city suffered from structural recession and the start of the era of “iron chilling”, an economic slowdown caused by decreased steel output, which was triggered by the first oil crisis. In the 1980s, Kitakyushu needed to urgently respond to the increase in municipal waste. With the advent of each challenge, Kitakyushu overcame its problems through collaboration with all stakeholders including industries, academia, the local government and the public by streamlining and improving efficiency in all aspects, and also by promoting industrial restructuring.

Nowadays, there have been advancements in new industries such as automobiles, robots and information technology (IT), and urban infrastructure has been enhanced, including the introduction of a new airport and the improvement of the city’s harbors. Kitakyushu is also promoting environmental industries through such projects as the Kitakyushu Eco-Town to achieve the development of a recycling-oriented society.⁵

Even though it faced a number of crises, Kitakyushu found the strength to fight against adversity because of its indomitable spirit and collaborative partnerships among industries, the local government, academia and local residents.⁶ Over its history, Kitakyushu has often been ahead of the times as it experienced issues earlier than other cities and is often referred to as a “microcosm of Japan” or the “future of Japan”. The city has raised its visibility in and outside of Japan as it continues to contribute to the creation of a sustainable society by widely disseminating its knowledge, experience and technologies developed in the process of addressing local challenges (Figure 2.2).

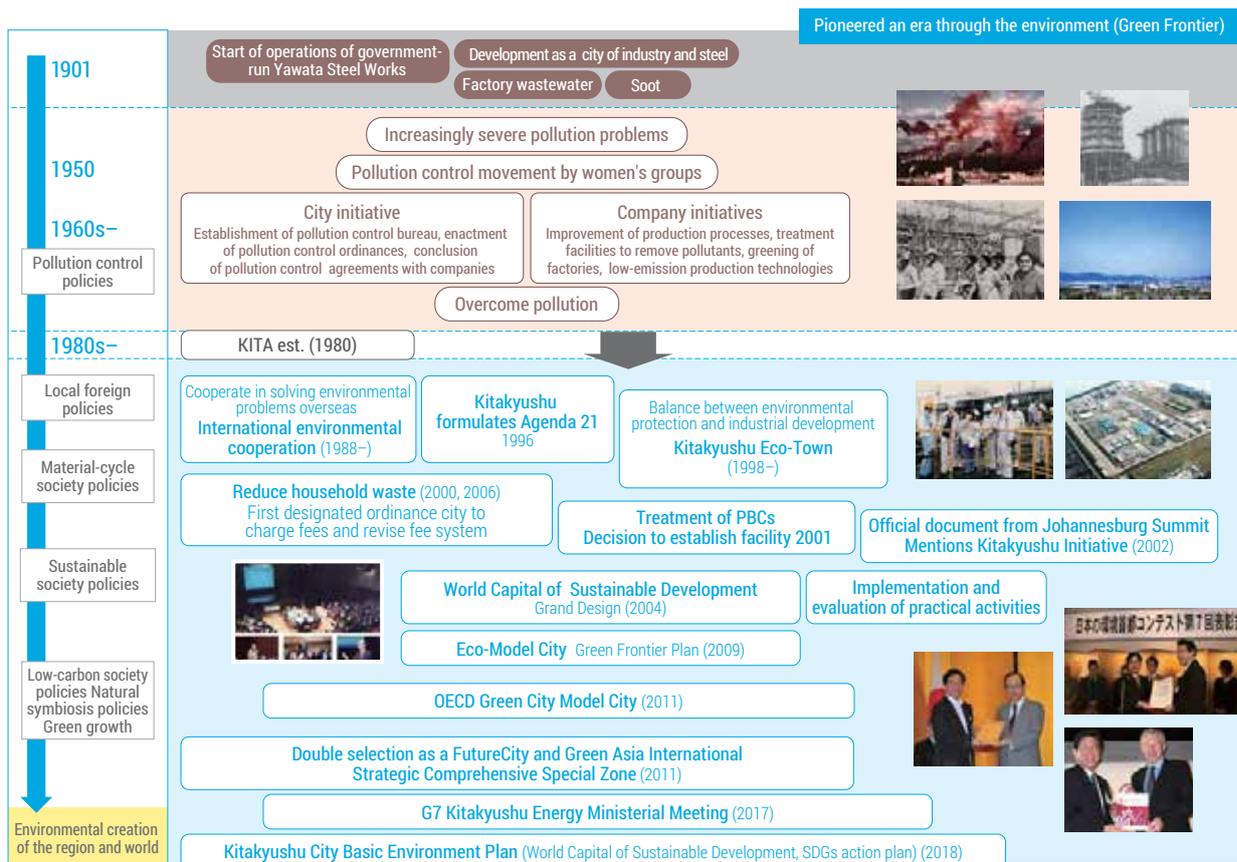


Figure 2.2. Transition of environmental administration of Kitakyushu

Source: City of Kitakyushu “History of International Environmental Cooperation”

⁵ City of Kitakyushu. “Energistic Start! Kitakyushu Plan (Kitakyushu City Basic Concept/Basic Plan)” (Formulated in December 2008, revised in December 2013)

⁶ Public Relations Office, Press Section Division, City of Kitakyushu. “The Essence of ‘Kitakyushu-ism’: Urban Management Changing Crises to Progress”. Weekly Diamond Custom Made issue from August 2 to December 20, 2014.

2 Origin of intercity cooperation

The origin of intercity cooperation in Kitakyushu can be found in its history of overcoming pollution. Kitakyushu, which once grew as a city of steelmaking, suffered from air and water pollution due to the massive amounts of dust, wastewater and solid waste discharged into the environment. The state of the environment at that time can be summed up with these words that were so popular at the time: "rainbow of smoke" and "sea of death". Mothers who felt a sense of crisis about the living environment and health hazards stood up and took action under the slogan of "We Want Our Blue Sky Back", through which they actively conducted campaigns to demand that companies and the local government improve the environment with the use of data on the state of pollution that they collected under the guidance of university professors. Since then, the industry, local government, academia and residents have moved to improve the environment through a collaborative partnership. In addition to introducing countermeasures at discharge points for the treatment of wastewater and exhaust gas (end-of-pipe), companies have also introduced

cleaner production technologies to reduce environmental loads by first inspecting manufacturing facilities and reviewing production processes. Meanwhile, the local government worked on pollution control measures by advocating, for example, the development of institutional arrangements, improvement of regulatory systems, and the conclusion of "pollution control agreements" with companies. As a result, the living environment in Kitakyushu improved significantly, including the drastic reduction of fallen dust and, the improvement of the water quality of Dokai Bay by the middle of the 1970s. This improvement has been immortalized in four pictures (Figure 2.3). Through this series of efforts, Kitakyushu developed its environmental management capacity as a local government, the environmental technologies of enterprises, and the environmental power of its residents, which enabled the simultaneous improvement of the living environment and development of industries (Fig. 2.4). Urban regeneration through partnerships in Kitakyushu can be an excellent reference to cities in developing countries, where environmental degradation is a concern due to rapid urbanization.



Figure 2.3. Photos symbolizing Kitakyushu's efforts to overcome environmental pollution

Source: City of Kitakyushu. "Efforts to overcome pollution"

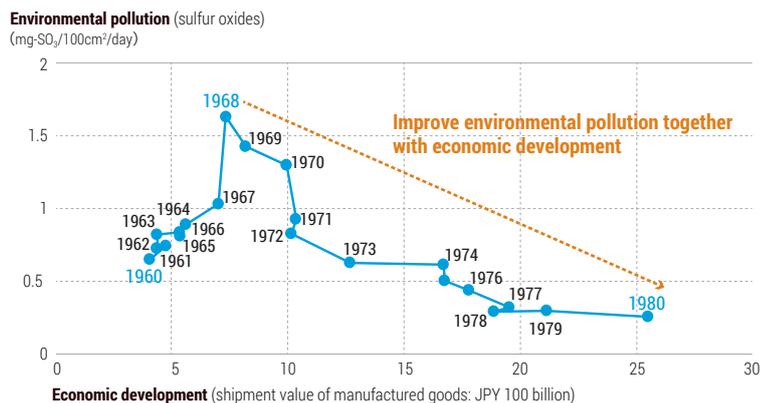


Figure 2.4. Compatibility of environmental policy and economic policy in Kitakyushu

Source: World Bank. "Japan's Experience Survey"

3 Keywords in development: “environment”, “Asia” and “*monozukuri* (technology)”

The master plan of Kitakyushu⁷ sets forth the goal of community development as an “environment and technology city that cultivates people and cultures and connects to the world” and aims to be branded as a “World Capital of Sustainable Development” and “Technical Capital of Asia”. Ties with overseas, especially with Asia, has always been included in the departmental plans of the master plan, such as the Kitakyushu City International Policy Promotion Outline⁸, Kitakyushu City Basic Environmental Plan⁹, and New Growth Strategy of the City of Kitakyushu¹⁰. In the revised third action plan of the “Kitakyushu Renaissance Master Plan” (formulated in March 2004), the phrase “towards the creation of a World Capital of Sustainable Development” was positioned at the very start of information on priority efforts and the direction of city development. The basic concept of this action plan is that Kitakyushu not only promotes environmental measures within the municipality, but also disseminates the knowledge and technology developed in the city to other cities and countries overseas. Since then, the terms “environment”, “Asia” and “*monozukuri* (technology)” have been found in all of the city’s administrative plans as keywords for the development of Kitakyushu.

4 Ideas from the residents of Kitakyushu on international environmental cooperation

In Kitakyushu, there is a document titled the “Commitment of the Residents of Kitakyushu to All People, the Earth and Future Generations—Towards the creation of a ‘World Capital of Sustainable Development’— (Grand Design)”, which was formulated through discussions with the city’s residents, companies, non-profit organizations (NPOs), and other stakeholders in society over a period of about two years. The document shows the local agreement on the image of a future sustainable society in Kitakyushu and the commitment by stakeholders in Kitakyushu to achieve a “World Capital of Sustainable Development”. It was formulated at the Fourth Council on the Creation of a World Capital for Sustainable Development held on October 9, 2004, after taking steps to gather ideas from residents and companies, multiple discussion sessions and the creation of a draft at the World Capital for Sustainable Development (Note: Subcommittees for resident working groups, industry working groups and urban working group fall under this council). The tenth principle in the “10 Principles of Environmental Action of the People of Kitakyushu” contains the phrase “Channeling the concept of a model environmental city to all people of the world”. The Grand Design underlies the current environmental policy of Kitakyushu, and intercity cooperation has been promoted based on this principle.

Table 2.1. Overview of the World Capital of Sustainable Development

Basic Philosophy	Creation of a city with true wealth and prosperity, inherited by future generations
Three pillars to support this philosophy	<ul style="list-style-type: none"> ● Living together, creating together ● Developing economically through environmental actions ● Enhancing the sustainability of the city
10 Principles of Environmental Action of the People of Kitakyushu	<ol style="list-style-type: none"> 01 Intensifying the environmental power of the city through the laughter and strength of the people 02 Advocating the advancement of exceptional environmental human resources 03 Valuing the significance of visible local ties 04 Encouraging the symbiotic relationship with all living things through a deeper understanding of nature 05 Protecting our valuable urban assets in the quest for beauty 06 Reducing the urban load on the environment 07 Stimulating the market for innovative environmental technology with the participation of local actors 08 Advocating the use of recycled resources in socio-economic activities 09 Sharing environmental information for further actions 10 Channeling the concept of a model environmental city to all people of the world

Source: The City of Kitakyushu. 2014. “Commitment of the Residents of Kitakyushu to All People, the Earth and Future Generations—Towards the creation of a ‘World Capital of Sustainable Development’— (Grand Design).”

7 City of Kitakyushu. “Energistic Start! Kitakyushu Plan (Kitakyushu City Basic Concept/Basic Plan)” (Formulated in December 2008, revised in December 2013). The basic plan is valid until 2020.

8 “Kitakyushu City International Policy Promotion Outline” (Formulated in February 1993). This plan has been renewed every five years since 1993.

9 “Agenda 21 Kitakyushu” (Formulated in March 1996) and “Basic Environmental Plan” (Formulated in October 2007, revised in February 2013, revised in November 2017)

10 “New Growth Strategy of the City of Kitakyushu” (Formulated in March 2013, revised in March 2016)

5 “Kitakyushu-ism” - A positive attitude to overcome problems

Since its triumphant victory over pollution, Kitakyushu has actively worked on the most advanced environmental issues, including efforts to build a material cycle society such as coping with the increase of municipal solid waste and improving waste management, and from a global perspective, efforts to build a low-carbon society to deal with climate change and contribute to the development of a sustainable society. These efforts all aim at a balance between economic development and environmental conservation, and emphasis is placed on revitalizing the city. The attitude of Kitakyushu, which boldly challenges itself to take on urban issues earlier than other Japanese cities, has been embodied in the concept of “Kitakyushu-ism”¹¹.

For example, Kitakyushu Eco-Town, which advocates “zero emissions”, was the first Eco-Town approved by the Japanese government in 1997 as a unique regional policy integrating “environmental conservation policies” and “industrial promotion”. It boasts the largest business concentration in Japan, where 27 projects (as of March 2018) and 60 empirical studies (as of March 2017) are being carried out, with approximately 1,000 employees (as of March 2017).¹²

In 2008, Kitakyushu was selected as an “Eco-Model City”, which is a city that takes up pioneering efforts with a high goals to realize a low-carbon society. As an Eco-Model City, Kitakyushu aims to develop itself as a low-carbon city by setting greenhouse gas (GHG) reduction targets to reduce 50% of emissions in Kitakyushu and 150% of emissions in Asia as compared to the GHG emissions in Kitakyushu, as stated in the “Eco-Model City Action Plan (Green Frontier Plan)”. Furthermore, in 2011, Kitakyushu was also selected as a “Future City”, which is a city that challenges issues common to humankind such as the environment and aging society.¹³ As a pioneering model city, Kitakyushu has implemented various measures, such as demonstration projects of smart communities that manage energy at the local level, the Kitakyushu City Regional Energy Hubs Development Project, and investment in a regional energy company, all of which aim to bring multiple benefits to the region, such as promoting industrial development, addressing climate change and improving resiliency by promoting the local production and local consumption of energy. Such efforts have been recognized on the international stage, and as a result, Kitakyushu was selected as a green growth city in the Green Cities Programme of the Organisation for Economic Co-operation and Development (OECD), as the first case in Asia, together with Paris, Chicago and Stockholm in 2011 (Figure 2.5).¹⁴



Figure 2.5. Mayor Kenji Kitahashi with the Kitakyushu Report of the OECD Green Cities Programme
Source: City of Kitakyushu. “OECD Green City Program”

6 Objectives and tools of intercity cooperation of Kitakyushu

Kitakyushu City, as a local government, has been actively involved in international intercity cooperation in order to contribute to improving the welfare of its residents. Specifically speaking, they are committed to local environmental conservation through global environmental conservation, promoting local economies through international environmental business and developing policies in Kitakyushu through mutual studies on advanced environmental policies.¹⁵

In Kitakyushu, where the local government actively responds to environmental problems common to Japanese cities and continues to develop original measures, know-how on urban environmental administration has been compiled in processes over the years and systematically organized as the “Kitakyushu Model for Exporting the Concept of Green Cities” (Kitakyushu Model) (Figure 2.6 - 2.8). Kitakyushu can export the concept of Green Cities (eco-friendly cities) by providing comprehensive urban solutions tailored to the needs of the counterpart city based on the Kitakyushu Model.

There are also 67 interactive learning facilities that not only convey knowledge but also allow people to visit Kitakyushu and gain a sense of the atmosphere of actual sites (Figure 2.9).¹⁶ These facilities include not only environmental museums and other types of facilities, they also comprise private companies located in Kitakyushu Eco-Town.

This makes it possible for delegates from local governments of cooperating cities to deepen their understanding of Kitakyushu's efforts by systematically introducing knowledge and providing opportunities to interact at actual sites.

¹¹ Public Relations Office, Press Section Division, City of Kitakyushu. “The Essence of ‘Kitakyushu-ism’: Urban Management Changing Crises to Progress”. Weekly Diamond Custom Made issue from August 2 to December 20, 2014.

¹² City of Kitakyushu. “Kitakyushu Eco-Town Project” March 2018.

¹³ Cabinet Office. “FutureCity” Initiative.

¹⁴ City of Kitakyushu. “OECD Green City Program”.

¹⁵ City of Kitakyushu. “Report on International Environmental Cooperation with Dalian City” (1995)

¹⁶ City of Kitakyushu. “Interactive Environmental Learning Facility Guide ‘Doko Eco!’” Published in July 2015.

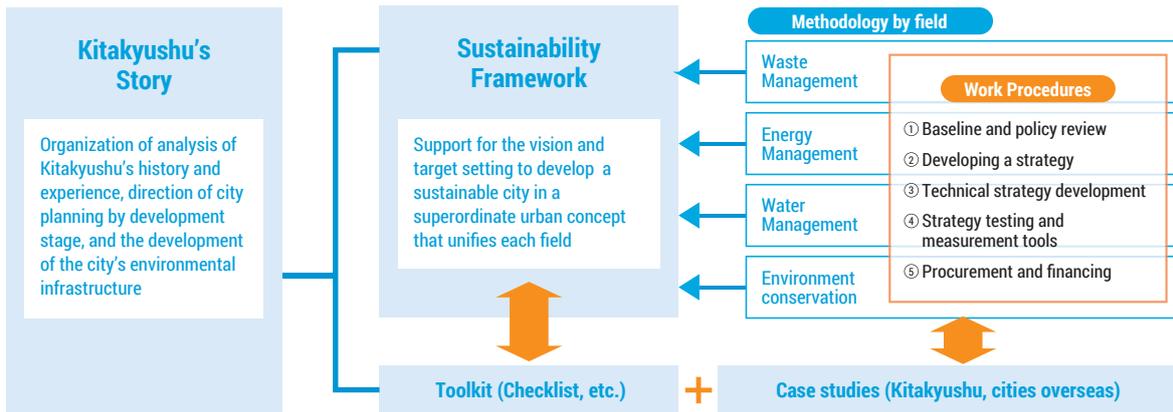


Figure 2.6. Framework of the Kitakyushu Model Source: Kitakyushu Asian Center for Low Carbon Society

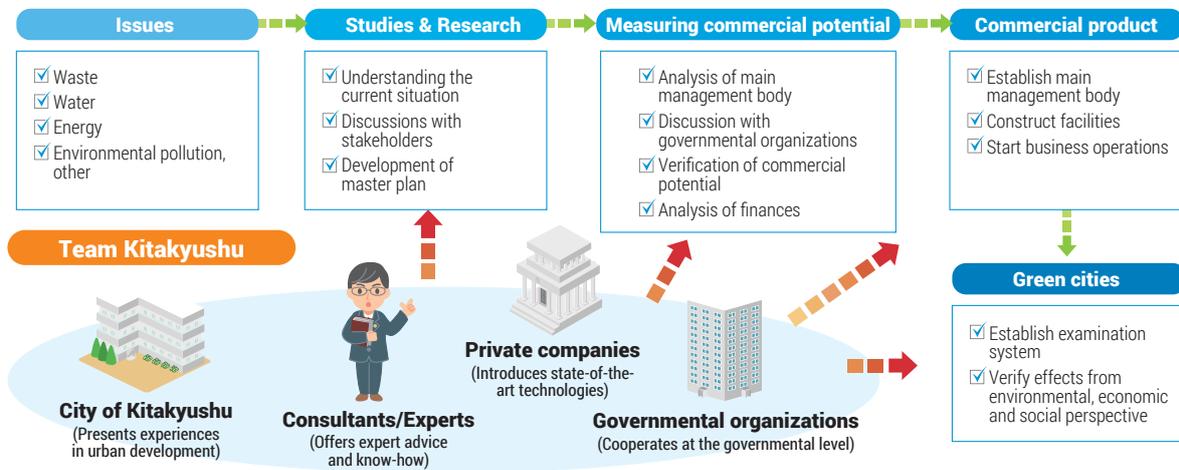


Figure 2.7. Application of the Kitakyushu Model Source: Kitakyushu Asian Center for Low Carbon Society



Figure 2.8. Expected results & outcomes by using the Kitakyushu Model

Source: Kitakyushu Asian Center for Low Carbon Society



Figure 2.9. “Doko Eco!” introducing interactive environmental learning facilities

Source: City of Kitakyushu. “Doko Eco!” Published in July 2015

7 Types of intercity cooperation in Kitakyushu

Intercity cooperation in Kitakyushu can be roughly divided into four categories (Table 2.2): (1) receiving trainees from other cities and conveying the information of Kitakyushu comprehensively (acceptance of trainees and site visits), (2) dispatching experts such as Kitakyushu City officials according to the needs of the counterpart city and sharing information on Kitakyushu (dispatch of experts), (3) sharing information on Kitakyushu at city network meetings where multiple cities participate (participation in city networks), and (4) transferring knowledge and technology through the implementation of actual projects (city-to-city collaboration). Although a wide range of

knowledge can be shared through (1) to (3), this may not lead to actual improvements in the urban environment. On the other hand, although the target field is narrow in (4), more detailed knowledge can be obtained by implementing concrete actions, which in fact will lead to improvements in the urban environment. City-to-city collaboration in Kitakyushu is unique in the sense that it develops a large number of projects to be carried out between the two cities, which results in improvements in the environment of the cooperating city. These efforts have been widely acclaimed both within the country and globally. The Kitakyushu Asian Center for Low Carbon Society has cooperated with 57 cities¹⁷ in Asia in the form of city-to-city collaboration based on the achievements made public over the past seven years (including feasibility studies). Kitakyushu is also working with six cities¹⁸ to improve the

Table 2.2. Forms of intercity cooperation in Kitakyushu

Form	Characteristic
Acceptance of trainees and site visits	Human resources are developed in Kitakyushu by accepting trainees from abroad. It is mainly implemented in cooperation with JICA and KITA, and as of March 2018, 9,083 trainees have been accepted from 165 countries. The Seminar for Eco-Town Managers (SETM) has also been implemented since 2011 in cooperation with the United Nations Industrial Development Organization (UNIDO). In addition, trainees are often accepted as part of a collaboration project between two cities.
Dispatch of experts	Kitakyushu dispatches appropriate personnel upon request by entities such as a counterpart city, the Japanese government and local companies. Staff share information and provide instruction on site. Experts are often dispatched as part of a collaboration project between two cities.
Participation in city networks	Sharing information to solve common environmental problems in a city network where multiple cities participate.
City-to-city collaboration	A concrete project is launched and implemented by Kitakyushu and the partner city to improve environmental conditions in the partner city. City-to-city collaboration covers a wide range of activities, from support for the development of master plans to the introduction of concrete technology through the application of the Kitakyushu Model.



Figure 2.10. City network of Kitakyushu Source: City of Kitakyushu. "Environment of Kitakyushu City 2017"

¹⁷ Information as of March 2017 (Source: Pamphlet of the Kitakyushu Asian Center for Low Carbon Society)

¹⁸ Kitakyushu collaborates with Shanghai, Tianjin, Wuhan, Tangshan, Handan and Dalian in a city-to-city collaboration project between Japan and China on air pollution countermeasures of the Ministry of the Environment, Japan.

ambient environment of cities in China.

Kitakyushu is also connected with many cities through the establishment of its own city networks. The city runs an Environmental Working Group under the “Organization for the East Asia Economic Development (OEAED)”¹⁹ (11 cities in China, Japan and South Korea) and promotes information sharing among participants. There is also a city network for Southeast Asia called the “Organization for City-to-City Environmental Cooperation in Asia”²⁰ (Figure 2.10). There are many cases that have evolved into closer cooperation as a result of such networks.

Cooperation with various stakeholders inside and outside the city is the key to developing intercity cooperation. There are various organizations such as the Kitakyushu International Techno-cooperative Association (KITA), which has been promoting the development of

global human resources, Kyushu International Center of the Japan International Cooperation Agency (JICA), Kitakyushu Urban Centre of the Institute for Global Environmental Strategy Strategies (IGES), academic institutions such as the University of Kitakyushu, and private companies. It is possible to develop diverse forms of intercity cooperation in Kitakyushu by promoting organic collaboration among these organizations.

8 International acclaim

Intercity cooperation that widely disseminates the efforts of Kitakyushu to improve the local environment overseas has been received to high acclaim on the international

Table 2.3. International acclaim gained from Kitakyushu’s international environmental cooperation efforts

Year	International acclaim (Organizer)	Contents
1990	Received “Global 500 Award” (United Nations Environment Programme (UNEP))	Appreciation for efforts to improve the local environment and international cooperation. * First municipality to be recognized in Japan.
1992	Received “Local Government Honours” at the United Nations Conference on Environment and Development (Earth Summit)	Appreciation for Kitakyushu’s contributions to sustainable development, environmental conservation and international environmental cooperation. * One of 12 cities in the world and the first municipality to be recognized in Japan.
2000	Adoption of the Kitakyushu Initiative for a Clean Environment at the Ministerial Conference on Environment and Development in Asia and the Pacific (MCED)	It was adopted as an initiative to improve the urban environment in the Asia-Pacific region by widely sharing Kitakyushu’s experiences. In addition, the “Kitakyushu Initiative for a Clean Environment” was stipulated in the agreement document of the World Summit on Sustainable Development (Johannesburg Summit) held in 2002.
2002	Received “Earth Summit 2002 Sustainable Development Award” (England and the Royal Society of Arts / RSA et al.)	Mayor of Kitakyushu received the award. * Only two people in the world won this award.
2011	Selected as Green Growth City in OECD’s Green City program (OECD)	Kitakyushu was selected as an urban development model with a balance between the environment and economy. * Four cities in the world and the first municipality in Asia.
2016	Adoption of the “Kitakyushu Initiative on Energy Security for Global Growth Joint Statement”.	Under the theme of “Energy security that supports global growth”, the initiative was adopted at the G7 Kitakyushu Energy Ministers Meeting as a joint statement after discussions on energy investment promotion, energy security enhancement and sustainable energy.
2017	Received a Special Award at the “1st Japan SDGs Award” (SDGs Partnership Award) (Sustainable Development Planning (SDGs) Promotion Headquarters)	The following aspects were evaluated: “international environmental cooperation” to promote environmental conservation according to the needs of the partner country, “international environmental business” such as water projects through public-private partnerships and “efforts by self-government associations and ESD” that aims to solve regional issues.
2018	Selected as a model city for promoting the SDGs (OECD)	Evaluation of Kitakyushu’s history of overcoming pollution and advanced measures to address environmental issues. * The program covers about 10 to 12 cities in the world. First municipality from Asia.

19 This organization was established on 16 November 2004 with the aim of forming a new wide-area economic zone in the Yellow Sea region and contributing to the development of the East Asian economic zone by promoting the revitalization of economic activities and intercity exchanges through collaboration among member cities, economic exchanges, and strengthening mutual networks, etc. There are 11 member cities: Dalian, Tianjin, Qingdao, Yantai, Busan Metropolitan City, Ulsan Metropolitan City, Incheon Metropolitan City, Fukuoka, Shimonoseki, Kumamoto and Kitakyushu. Economic exchanges have been promoted through the activities of sectoral working groups on manufacturing, environment, logistics and tourism.

20 This city network was established in February 2010 through the reorganization of the “Environmental Cooperation Network of Asian Cities” and the “Kitakyushu Initiative Network”. The “Environmental Cooperation Network of Asian Cities” was established in December 1997 consisting of Kitakyushu and six cities from four countries in Southeast Asia (Patangas and Cebu of the Philippines, Ho Chi Minh of Vietnam, Penang of Malaysia, Semarang and Surabaya of Indonesia). The Kitakyushu Initiative Network consisting of 173 cities in 19 countries was established to implement the “Kitakyushu Initiative for a Clean Environment” adopted at the 4th Ministerial Conference on Environment and Development in Asia and the Pacific (MCED) held in Kitakyushu in September 2000.

stage, with its first appearance in a white paper on the environment by OECD in 1985, in which Kitakyushu was introduced as a city that had transformed itself “from a gray city to a green city”. Kitakyushu has won numerous awards since receiving the “Global 500 Award” from the United Nations Environment Programme (UNEP) as the first Japanese municipality to be so honored in 1990, and as a result, has succeeded in attracting major international events to the city. It is noteworthy that Kitakyushu has developed an international reputation for its efforts, for example, with its selection as a Green Growth City by OECD and a model city for promoting the SDGs for the first time in Asia²¹.

9 Conclusion

Kitakyushu has been working in the field of international cooperation for nearly 40 years through partnerships among industries, the local government, academia and the public, based on the intentions of the city’s residents and local enterprises by developing infrastructure inside of the city rooted in the concepts of the “environment”, “Asia” and “*monozukuri* (technology)”. Through such ongoing efforts, Kitakyushu has developed a method to transfer the technologies and know-how developed in the city to Asia and established a mechanism that enables diverse entities to collaborate organically. Persistent cooperation between Kitakyushu and various Asian cities was the key to helping Kitakyushu reach this point. In Chapter 3, the details of Kitakyushu’s experience in intercity cooperation, how Kitakyushu was able to maintain continuity in its cooperative activities, and how the city has expanded and deepened their efforts will be discussed through case studies on cooperation with five cities in Asia.

²¹ City of Kitakyushu. “OECD has chosen the City of Kitakyushu as the Asia’s first model city for promoting SDGs.” Press release on 23 Apr 2018.

Chapter 3

Examples of Cooperation between Kitakyushu and Asian Cities



Collaboration with Dalian, People's Republic of China

The City of Dalian in the People's Republic of China (hereinafter referred to as "China") is Kitakyushu's first partner city, with which it developed intercity cooperation activities in the field of the environment. In 1979, the cities concluded a friendship city agreement, and in the close to 40 years since the start of international environmental cooperation in 1981, they have continued to cooperate in diverse ways in response to changes in the times. This section will take a look back on the many years of ties between the two cities, the catalysts that sparked intercity cooperation in the field of the environment, the development from international cooperation to overseas business, and the achievements from these activities.



1 Catalyst for cooperation

1.1. Geographical connections and trade exchange

The City of Dalian is located in the southernmost tip of Liaodong Peninsula in Liaoning Province. The city is surrounded by the Yellow Sea, which flows into the Bohai Inland Sea to the west and the open waters of the East China Sea to the east. The city developed as the largest trade base in the northeastern region of China due to its proximity to Korea and the Kyushu region of Japan and favorable geographical conditions stretching to Southeast Asia and the Pacific region. In 1984, Dalian was designated as an "open coastal city" by the State Council of China. Located at 38 degrees north (equivalent to the City of Sendai in Japan), Dalian is blessed with an oceanic climate in a continental monsoon climate, a relatively temperate zone with four distinct seasons, and an exceptional, ice-free port.¹

Located in the Tsushima Straits to the east in the East China Sea, the City of Kitakyushu has developed as a trading port with the Asian continent since ancient times and was designated as an "international base port" in Japan in 1951. The ports of Moji and Dalian, located across the Yellow Sea within 1,000 km, had been connected by a regular shipping route from 1929 to 1944 and signed

a friendship port agreement in 1985.² The Kitakyushu Commemorative Library of International Friendship, which stands out strikingly among the landmark group of buildings in the Mojiko Retro area, is a replica of a historical building from the era of Russian rule in Dalian and was built in 1994 to commemorate the 15th anniversary of the friendship city agreement between both cities, as a symbol to the depth of their relationship.³

Both Dalian and Kitakyushu have built up connections over many years as trading ports in the Yellow Sea area. This foundation has become a favorable factor in the selection of partners for friendship cities.

1.2. Political turning points

In 1972, then Prime Minister Kakuei Tanaka and former Premier Zhou Enlai signed the "Joint Communiqué of the Government of Japan and the Government of the People's Republic of China", which established diplomatic ties between Japan and China for the first time since the People's Republic of China was founded in 1949. In response to this communiqué, the "Treaty of Peace and Friendship Between Japan and the People's Republic of China" was concluded in 1978.⁴ Seizing the normalization of diplomatic ties between China and Japan as an opportunity, Kitakyushu wished to conclude a friendship city agreement with Dalian, which had long been its trading partner and had a similar urban environment, in order to

1 Consulate-General of Japan in Shenyang (2016), Overview of Dalian

2 Kitakyushu Seaport and Airport Bureau (2017), History and role of Kitakyushu Port (online): <http://www.kitaqport.or.jp/jap/outline/history.html>

3 Mojiko Retro (2017), Information on Mojiko Retro (online): <http://www.mojiko.info/2retro/>

4 Ministry of Foreign Affairs (2017), People's Republic of China (online): <http://www.mofa.go.jp/mofaj/area/china/>

further promote friendly exchange with China. In 1979, the year after the treaty was signed, Dalian and Kitakyushu concluded a “friendship city” agreement.⁵ In this way, the stance of Kitakyushu—to rapidly link major movements domestically and internationally to action at the city level—can be seen throughout subsequent international environmental cooperation activities and can also be said to be a maxim to which Kitakyushu would subscribe in becoming a frontier presence for local governments.

1.3. Matching the needs of both cities

Chapter 2 touches upon how Kitakyushu, which had developed significantly as a city of iron and steel, was plagued by horrific pollution from the 1950s to the 1970s and overcame this situation through partnerships between industry, the government, academia, and civic society by the middle of 1970. After 1980, when Kitakyushu prevailed over pollution, environmental problems in China caused by industrialization escalated. Although Dalian grew into a key industrial city in China with the development of the cement, chemical, iron and steel, and pharmaceutical industries, the city also faced environmental problems, including profound air pollution. Dalian’s energy sources showed a high dependency on coal at about 70% and sulfur dioxide

(SO₂) concentrations generated by the consumption of coal fuel exceeded air pollution standards in China (National standard class 2) applied to industrial areas.⁶ Based on this situation, Dalian adopted the slogan of “not seeking the biggest but pursuing the best” and would follow the path taken by Kitakyushu. At that time, Kitakyushu faced the decline of heavy industry and launched a policy to promote international cooperation with the environmental technologies that had been accumulated in Kitakyushu through the years of battling pollution. Here is where the needs of both cities—Dalian seeking expertise in environmental improvement and Kitakyushu wanting to branch out overseas with this environmental improvement technologies—were in sync.

Thus, both cities developed as international trade ports and industrial cities, sharing such characteristics as being positioned as national strategic bases for overseas, even though they are local cities. These similarities mean that both cities faced the similar challenges and possibilities. It was an efficient and inevitable trend for Kitakyushu then to convey the lessons learned and experiences gained in the process of development first by Kitakyushu and subsequently followed by Dalian.

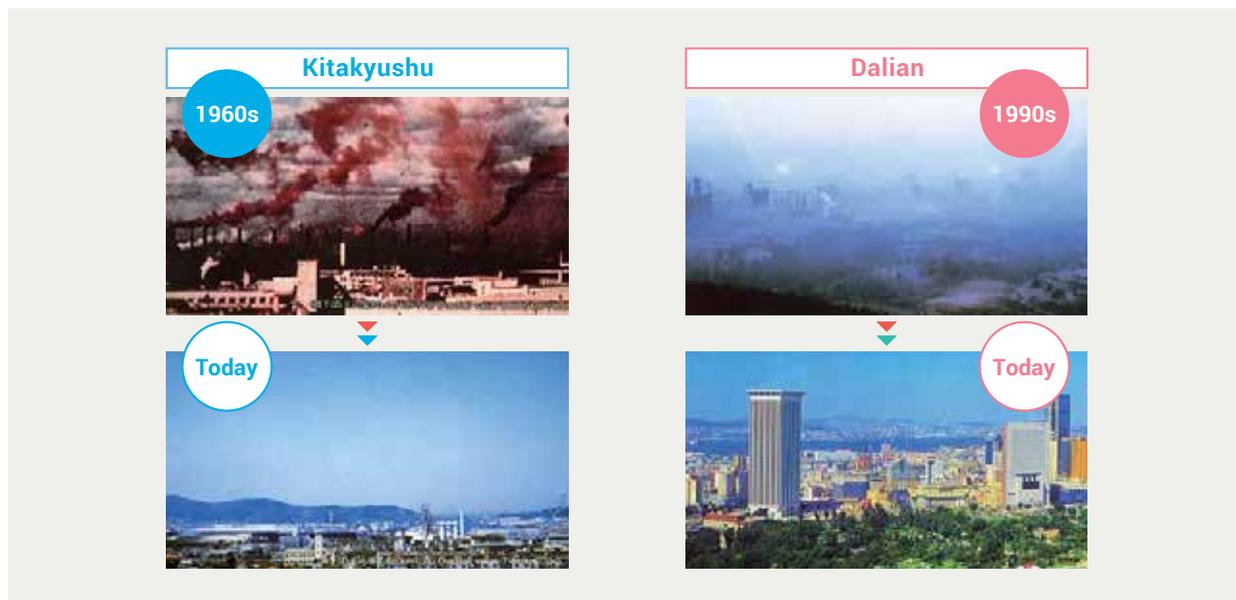


Figure 3.1.1. Changing skies in Kitakyushu and Dalian Source: City of Kitakyushu

2 Development of intercity cooperation

Intercity cooperation, which began after the conclusion of the friendship city agreement in ways that met the needs of both cities, has continuously developed as cooperative

activities in several areas for about 40 years in connection with movements of both countries. It is worth noting that in both cities, which first had a platform for collaboration in international trade in place, initiatives had been developed that placed a focus on not only international environmental cooperation, but also business development of local companies. In the next section, the state of development in each area will be discussed in detail.

⁵ City of Kitakyushu (2015), FY 2015 Kitakyushu international project handbook
⁶ Junko Miura (2011), Environmental Model City (Dalian), Post-Evaluation Report. Global Link Management

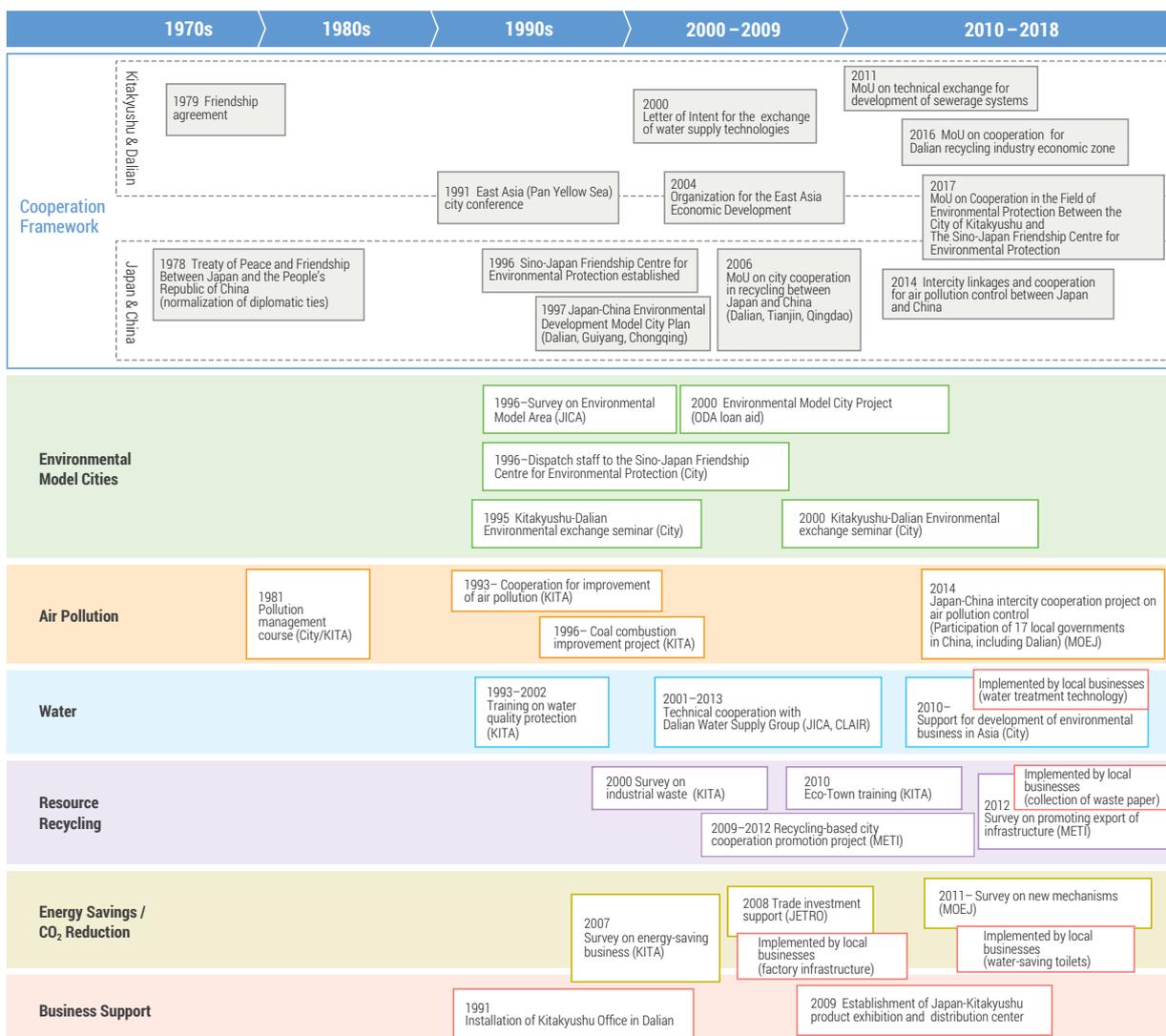


Figure 3.1.2. Main framework of collaboration between Kitakyushu and Dalian and results of cooperation by sector

2.1. International cooperation as new material to activate the region

2.1.1. Start of cooperation through the development of human resources

Cooperation in the field of the environment between the cities of Kitakyushu and Dalian started with the dispatch of three officials from the Kitakyushu Pollution Control Bureau as lecturers to Dalian to lecture a course on pollution control in 1981, two years after the conclusion of the friendship city agreement in 1979.⁷ International exchange during this time mainly focused on the areas of culture and sports and intercity exchange on the theme of the environment was a trailblazing endeavor.

Human resource development-based cooperation continued to be carried out after, providing guidance on the administrative and technical knowledge of Kitakyushu through courses and seminars for government staff and

company engineers in Dalian. To expand the scale and areas of cooperation, about 40 staff from Kitakyushu and instructors from companies and the academic world in the three sectors of environmental protection, productivity improvement, and conservation technologies were dispatched to the “Kitakyushu-Dalian Technical Exchange Seminar”, held in 1993 to commemorate the 15th anniversary of the signing of the friendship sister city agreement between the two cities. In addition to human resources, equipment and instruments for practical training were transported from Kitakyushu to Dalian at a cost of about JPY 90 million, which was borne by Kitakyushu.⁸ In 1995, the “Kitakyushu-Dalian Environmental Exchange Seminar” was held on the theme of environmental protection technologies, with 36 instructors dispatched from Kitakyushu. In addition to the organization of such seminars in Dalian, the two cities jointly created

⁷ Kitakyushu Environment Bureau (n.d.), Story of Environmental Friendship: Return of Dalian's blue sky

⁸ Institute for Global Environmental Strategies (1998), Workshop report on the status of the environment in Dalian, China

environmental educational materials and factory officials from Dalian and city staff from the Environmental Protection Bureau visited Kitakyushu as trainees.⁹

Concrete experience and knowledge on pollution control in Japan is more concentrated in local governments than the central government. Local governmental staff and human resources and technologies of local enterprises played an important role in the implementation of international cooperation in the field of the environment. The Kitakyushu International Training Association (now, Kitakyushu International Techno-cooperative Association (KITA)), founded in 1980, launched countless training programs in Kitakyushu and played a key role in the international transfer of industrial technologies. Surveys and lectures on improving air quality (1993 to present) caused by coal and the improvement of combustion efficiency of commercial coal boilers (1996 to present), the creation of environmental educational teaching materials, and an industrial waste survey in 2000 were carried out in Dalian.¹⁰

2.1.2. Eco-Model City concept using Official Development Assistance (ODA)

With the 1992 UN Conference on Environment and Development (UNCED, Earth Summit), global-scale environmental initiatives involving the entire world began in earnest. For five years from fiscal 1992, the Japanese government announced an increase in Official Development Assistance (ODA) in the field of the environment from JPY 900 billion to JPY 1 trillion, achieving a record JPY 1.44 trillion, which far exceeded the target amount.¹¹ In response to this trend, Kitakyushu decided to develop international cooperation using ODA in the expanding environmental field.

When state officials visited Kitakyushu in 1993, the President of KITA proposed that Dalian become an environmental model district in China and the Mayor of Kitakyushu declared the city's intention to actively cooperate to realize this.¹² The "Dalian Environmental Model District" aimed to implement comprehensive and intensive environmental improvement projects and disseminate the results effectively throughout China. The Chinese government agreed with this proposal and positioned this plan as a priority project under the country's

national environmental policies.

Kitakyushu proposed the formulation of an environmental protection basic plan (master plan) for Dalian utilizing ODA from the Japanese government, which required consensus between the national governments, as plans in the environmental field were given priority at the national level. In response to this, the Chinese government requested the Japanese government to undertake a development study using ODA, and a Development Study "Dalian City Environmental Model Area Development Plan" was implemented from 1996 to 2000. This development study was the first of joint study of its kind by the City of Kitakyushu and the Japan International Cooperation Agency (JICA) (Japanese ODA executing agency), with the outcomes of the survey resulting in the development of full-scale ODA projects in the environment field. This successful case gained attention as a prototype illustrating new ways ODA could be coordinated between the national government and local government including private sector and civic society, in both Japan and developing countries, as shown in the figure below.

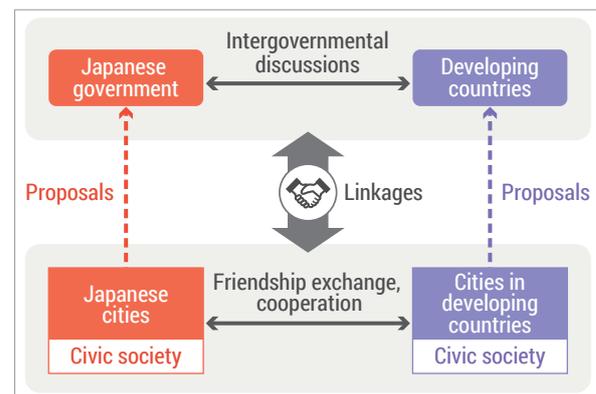


Figure 3.1.3. Linkages between intercity cooperation and intergovernmental cooperation (ODA)

Source: "International environmental cooperation with the City of Dalian, China", Website of the City of Kitakyushu

Subsequently, the "Japan-China Environmental Developmental Model City Plan" was proposed at the Japan-China Summit in 1997. The three cities of Dalian, Guiyang, and Chongqing were designated as model cities for the prevention of acid rain and air pollution and the formulation of recycling systems.¹³



Figure 3.1.4. Signing ceremony for the study on the Dalian Environmental Model Area plan (left) and the state of an iron factory in Dalian (right)

Source: City of Kitakyushu

9 City of Kitakyushu (1998), Commentary on the history of pollution control in Kitakyushu

10 Kitakyushu International Techno-cooperative Association (2013), History of KITAEC, 1992–2013

11 Ministry of Foreign Affairs (2018), Environment and ODA: Japan's Environmental ODA Initiatives (online): <http://www.mofa.go.jp/mofaj/gaiko/kankyo/oda.html>

12 Ryo Fujiwara (1991), Initiatives in environmental aid by local governments in Japan

13 Ministry of Foreign Affairs (1998), Joint presentation by the Governments of Japan and the People's Republic of China on environmental cooperation for the 21st century (online): http://www.mofa.go.jp/mofaj/kaidan/yojin/arc_98/c_kankyo.html

With collaboration between ODA and intercity cooperation, target areas for the Development Study “Dalian Environmental Model Area Development Plan” spanned several environmental areas, including air pollution control, sewage treatment, noise control, waste treatment, environmental administration (legal systems, organizational structures, monitoring, etc.), and low-pollution production technologies in factories (cleaner production). A team of consultants, including private companies in Kitakyushu that undertook the development study as ODA projects, conducted studies over a three-year period. At the same time, a survey team from Kitakyushu, comprising the city, KITA and companies, carried out expert studies and instruction under a separate budget. Based on this system, a feasibility survey on important measures to improve the environment, was carried out and the master plan was completed in 2000.¹⁴ As a result, the “Dalian Environmental Model City Project”, ODA loan assistance (yen-based loan), was signed with the Chinese government as borrower and Dalian as the implementing agency from fiscal 1999 to 2000, as part of the abovementioned Japan-China Environmental Development Model City plan. The projects contributing to environmental improvement in major factories in Dalian listed in Fig. 3.1.5 (total amount: JPY 8.5 billion) included the implementation of (1) environmental protection measures at a pharmaceutical plant in Dalian (installation of a production line together with factory relocation), (2) construction of thermoelectric plant in the Yandao chemical industrial zone., (3) extension of the Chunhai Thermoelectric Plant (funded by Dalian according to a request by the city of Dalian), (4) Dalian cement dust treatment, and (5) pollution control for electric furnaces at then Dalian Steel.

The planned reduction of pollutants set at each target factory was achieved, including sulfur dioxide (SO₂), suspended particulate matter (SPM), nitrogen oxide (NO_x), carbon monoxide (CO), and chemical oxygen demand (COD),



Figure 3.1.5. Target factories under the Environmental Model City Project

Source: Evaluation Report of the Environmental Model City Project (Dalian), 2011

among others. Dalian's Ninth Five-Year Environmental Protection Plan (1996–2000) and the 2010 Long-Term Plan aimed for annual average air pollutant concentrations in Dalian to meet class 2 national standards (standards for factory areas) by 2005. This target was also achieved.¹⁵

Normally, the national government takes the lead for ODA. However, the point to note here is that the agreement between the two national governments was achieved through initiative from local governments, one of the first cases of its kind. However, orders for ODA projects are based on competitive bidding and face challenges in that local companies in Kitakyushu may not always be able to win bids, signifying the challenge of a new stage of development, shifting from international cooperation to international business.

2.2. Start of cooperation with a focus on international environmental business

2.2.1. Promotion of recycling-based urban cooperation

With the designation of “zero emissions”¹⁶ in Japan, a concept of a resource recycling-oriented society proposed by the United Nations University in 1994, the Ministry of Economy, Trade and Industry (METI) and the Ministry of the Environment (MOEJ) started to promote the Eco-Town Project in 1997. The first Eco-Town Project in Japan was launched in Wakamatsu Ward in Kitakyushu City with an investment of a total of JPY 66 billion (investment ratio between the city, national government (others), and private sector at 1 : 2 : 7). The Eco-Town in Kitakyushu included the formation of a Practical Research Area and

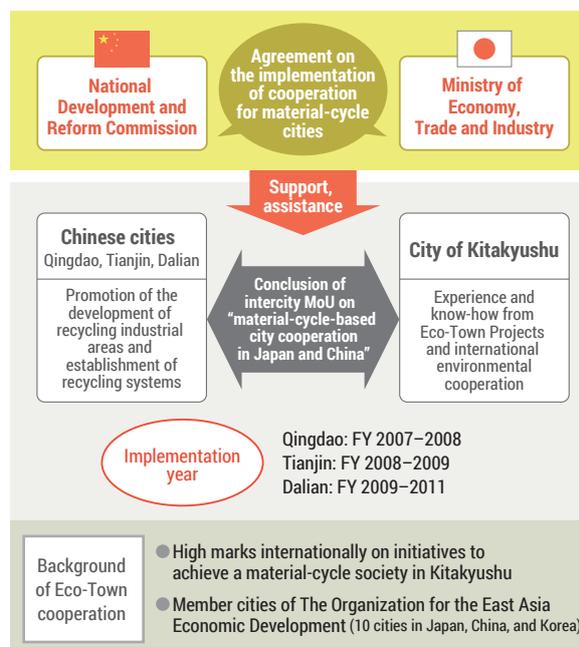


Figure 3.1.6. Material-Cycle City Cooperation Project in Japan and China (Eco-Town Cooperation)

Source: Ministry of Economy, Trade and Industry, EX Research Institute Ltd. (2012), FY 2011 Intercity collaboration (Kitakyushu and Dalian)

14 City of Kitakyushu (2018), International environmental cooperation with the City of Dalian, China (online): http://www.city.kitakyushu.lg.jp/kankyoku/fi/le_0274.html

15 Junko Miura (2011), Post-evaluation report on the Environmental Model City (Dalian), Global Link Management.

16 United Nations University Association (2007)

a Comprehensive Environmental Complex/Hibiki Recycle Complex.

In the "Memorandum of Understanding on Material-Cycle City Cooperation" signed in 2008, Japan agreed to support Eco-Town Projects in the cities of Qingdao, Tianjin, and Dalian (implemented between 2009 and 2011). The Japanese METI proposed the implementation of feasibility studies and support for Japanese companies involved in recycling businesses for waste tires, automobiles, waste paper, and waste.¹⁷ METI also provided support to Dalian for JPY 15 million annually as expenses for dispatching experts and the transfer of technology. The cost for the actual construction of the Eco-Town was raised by stakeholders in China.¹⁸

2.2.2. Kitakyushu Asian Center for Low Carbon Society and export of low-carbon technologies

Kitakyushu was selected as an "Eco-Model City"¹⁹ by the Japanese government in 2008. In addition to Kitakyushu's reduction targets for greenhouse gas (GHG) emissions in the city in its implementation plan, Kitakyushu set a target of reducing the amount of GHG emissions in the

Asian region by 2050 equivalent to 150% of its emissions in Kitakyushu in 2005 through the export of the city's environmental technologies. To achieve these targets, the Kitakyushu Asian Center for Low Carbon Society was established in 2010 and started to provide support for business development exporting Japan's low-carbon technologies. Four priority areas are cited: (1) energy management, (2) water business, (3) cleaner production and pollution control, and (4) recycling and waste treatment. Environmental technologies and social systems are being packaged through public-private partnerships to be transferred, aiming at an economic effect of increased sales of about JPY 5 trillion by 2020 (about 10% of the national government's target of JPY 50 trillion).^{20, 21}

The Kitakyushu Asian Center for Low Carbon Society supports local companies to carry out studies and projects towards the development of environmental business by making use of various funds from the Japanese government. As of March 2018, there have been five projects in Dalian, as shown in Table 3.1.1, which will lead to the signing of business agreements after the conclusion of the surveys.

Table 3.1.1. Studies and projects implemented for business development of Japanese companies in Dalian

Company name	Study and project name	Funds and schemes used Source (implementation year)	Results
Yaskawa Electric Corporation ^(a)	Demonstration project for the promotion of energy conservation with environmental equipment using drives to improve infrastructure in plants in Dalian, China	JETRO Expert Service Abroad (JEXSA): Japan External Trade Organization (JETRO) (2008)	Energy-saving and CO ₂ -reduction effects were demonstrated and Yaskawa drives (inverter) were adopted in the targeted plant.
TOTO Ltd. ^(b)	Feasibility study on new mechanisms for energy conservation together with reductions in water consumption through the spread of water-saving sanitation equipment in Dalian, China	Feasibility survey on new mechanisms: MOEJ(2011)	Methodology for the reduction of CO ₂ emissions through the spread of water-saving, water-supply housing equipment was established for the first time and certified in the domestic emission credit system.
City of Kitakyushu ^(c)	Promotion of material-cycle city cooperation through intercity cooperation (Kitakyushu and Dalian)	Study to promote the export of infrastructure and systems: METI (2009–2012)	Industrial concentration, promotional systems, collection systems, creation of incentives, and strengthening cooperation between private companies in Japan and China were proposed.
Matsumoto Mitsuharu Shoten Co., Ltd. ^(d)	Collection, use, and sales of waste paper in the Dalian National Eco-Industrial Zone model district	Study on promoting the export of infrastructure and systems (2012): METI (2012)	Solutions for technical, financial, and systematic challenges in the commercialization of waste paper recycling were proposed.
Nippon Steel Chemical Co., Ltd. ^(e)	Provision of nitrogen phosphorous removal technologies	Support for the development of environmental business in Asia for SMEs: City of Kitakyushu (2010)	Technologies to remove nitrogen and phosphorous, which causes water pollution, were adopted for water treatment at Dalian Port.

Source: (a) Yaskawa Electric Cooperation (2008), Yaskawa News 289, Yaskawa drives playing a role in energy savings in Dalian, China; (b) Mitsubishi UFJ Morgan Stanley Securities (2012), FY 2011 Feasibility study on new mechanisms for water reduction and energy savings through the spread of water-saving sanitary devices in Dalian, China; (c) EX Research Institute Ltd. (2011), FY 2000 Resource-circulation promotion project in Asia: Report on the promotion of material-cycle city cooperation through intercity cooperation (Kitakyushu and Dalian); (d) Matsumoto Mitsuharu Shoten Co., Ltd. (2013), FY 2012 Report on study promoting the export of infrastructure and systems: Collection, use, and sales of waste paper in the Dalian National Eco-Industrial Model Zone; (e) Kitakyushu Asian Center for Low Carbon Society (2011), Licensing of companies in Dalian, China for denitrification treatment technologies

17 Kitakyushu Asian Center for Low Carbon Society (2015)

18 Ikuyo Kikusawa (2011), Current state and challenges for international environmental cooperation and business in Japan and China: Case of Kitakyushu. The International Centre for the Study of East Asian Development

19 "Eco-Model Cities" are low-carbon cities that support the foundation of the "FutureCity" initiative and are cities and regions that are taking on the challenge to implement pioneering initiatives with lofty objectives to create low-carbon societies, such as the drastic reduction of greenhouse gas emissions. As of fiscal 2013, 23 cities have been selected as Eco-Model Cities. (Source: Website of the Office for Promotion of Overcoming Population Decline and Vitalizing Local Economy in Japan, Cabinet Office)

20 Kitakyushu Asian Center for Low Carbon Society (2014), Asian Green Camp: Kitakyushu Asian Center for Low Carbon Society

21 Hideo Naito (2014), Kitakyushu's Experiences and Future Trends in International Environmental Cooperation and Environmental Business with China

2.2.3. Technical exchange in the water sector

The Dalian Water Supply Group Co., Ltd. (hereinafter referred to as “Dalian Water Supply”) sent a request to the Kitakyushu Water and Sewer Bureau for technical cooperation in the water sector in 1999. In 2000, a “Letter of Intent for Technical Exchange in Waterworks” was concluded between both parties. What should be noted in this technical exchange is that, as shown in Table 3.1.2, three phases were planned according to the local situation and the growth process of Dalian Water Supply, with exchange programs carried out in phases.

As a result of the two preliminary field surveys by the Kitakyushu Water and Sewer Bureau which had received the request, it was found out that the development of new water sources would be difficult both geographically and financially and that the water leakage rate of Dalian, at about 15%, was about double that of Kitakyushu. Therefore, in the first phase of mutual exchange, staff from the Kitakyushu Water and Sewer Bureau were dispatched

to Dalian through the JICA Partnership Program and staff from Dalian Water Supply visited Kitakyushu as trainees through the Local Government Officials Training Program in Japan of the Council of Local Authorities for International Relations (CLAIR), with the objective of developing a “second” water source, which means to increase water supply by preventing leakage, rather than developing a new water source. The second phase secured the safety and stability of water supply in Dalian, followed by the third phase to support technical transfer from Dalian to other Chinese cities around Dalian. Cities around Dalian have water leakage rates of about 40%, with activities shifting to the promotion of the dissemination of technology and sustainable in China in the final stages.

In 2006, six employees from the Kitakyushu Water and Sewer Bureau received the Dalian Xinhai Friendship Award in recognition of the results of this cooperation, an award presented to foreign nationals who have made remarkable contributions to the development of Dalian.²²

Table 3.1.2. Water technical exchange project between Kitakyushu and Dalian

Phase	Implementation Period	Purpose	JICA Partnership Program	CLAIR Local Government Officials Training Program in Japan
Phase 1	2001–2004	Leakage prevention	Dispatch of experts	Acceptance of trainees
Phase 2	2005–2007	Improve safety and stability of water supply	Acceptance of trainees, dispatch of experts	
Phase 3	2008–2013	Technical transfer from Dalian to nearby cities	Acceptance of trainees, dispatch of experts	

Source: Decade of Friendship Exchange between Kitakyushu and Dalian, 2009. Kitakyushu Waterworks Bureau

With the “New Growth Strategy” of Japan, a Cabinet decision made in 2010, the overseas deployment of packaged infrastructure through public-private partnerships (PPP) became a national strategic project and the PPP Council for Overseas Water Infrastructure was established for the water sector.²³ In addition, the ODA budget to support international development of local governments was also strengthened. In response to this, Kitakyushu was the first local government in the country to establish the “Kitakyushu Overseas Water Business Association” in 2010 in partnership with the public and private sector, as well as academia and investigated the potential for the water business in Dalian in 2011.

In Kitakyushu, “technology succession” of the city’s staff is cited as an advantage in promoting overseas water business, in addition to economic growth. Due to the declining population in Kitakyushu, the necessity to expand waterworks is diminishing, the number of staff with experience in expansion projects has drastically decreased, and there are no opportunities for practical training related to expansion programs in the city. However, it will be necessary to maintain the number of human resources responsible for projects, such as infrastructure repairs and

updates in Kitakyushu in the future. The overseas water business is regarded as an opportunity to provide on-site training for Kitakyushu city staff onsite in Dalian, which is planning to expand its waterworks.²⁴

2.2.4. Support for the overseas deployment of small- and medium-sized enterprises

With a population of 5.93 million (2016), Dalian is the largest industrial city in northeastern China. Since the construction of the China National Economic and Technological Development Zone in 1984, the entry of foreign companies has moved forward at full tilt. In 2009, Dalian was positioned as the core region for the national project, “Liaoning Coastal Economic Zone Development Plan”, with the main industry shifting from conventional manufacturing to modern-day cluster industries (high level equipment manufacturing industries, shipbuilding/marine/shipping business, petrochemicals, electronic information and software outsourcing).

Japan is Dalian’s largest trading partner. As of 2016, there are about 4,600 Japanese companies out of more than 18,000 foreign companies and 750 companies registered as members at the Japanese Chamber of

²² Kitakyushu Water and Sewer Bureau and Dalian Water Supply Group Co., Ltd. (2009), Decade of Friendship Exchange Between Kitakyushu and Dalian

²³ Cabinet Office (2010), New Growth Strategy

²⁴ Kitakyushu Waterworks Bureau (2014), Overseas water business in Kitakyushu (Linkages with local companies)

Commerce and Industry, Dalian.²⁵ Many local governments in Japan, including Kitakyushu, (such as the prefectures of Kanagawa, Niigata, Toyama, Iwate, Miyagi, and Aomori, etc.) have opened offices in Dalian to support the activities of Japanese companies. In addition, in commemoration of the 30th anniversary of its friendship city relationship with Dalian, Kitakyushu collaborated with Fukuoka Prefecture's Small Business Entrepreneurs' Association and others to set up an overseas "challenge shop" called the "Japan-Kitakyushu Product Exhibition and Distribution Center" in Dalian in 2009 to publicize the brands of SMEs in Kitakyushu.²⁶ The city also organized business meetings between Dalian and Kitakyushu.

Consulting services by METI to support the overseas deployment of SMEs were set up in different locations around Japan in 2010. The Kyushu Bureau of Economy, Trade and Industry, JETRO, and the Kyushu branch of the Organization for Small & Medium Enterprises and Regional Innovation, Japan (SME Support, Japan) became the contact point for this service and established the "SME Overseas Development Support Council".

More recently, an international consortium (company association) participating in KK Investment Limited, a local company in Kitakyushu, received an order in 2017 for a JPY 200-million project to restore contaminated soil at the site of a pesticide factory in Dalian. This same company is a member of the Kitakyushu Interdependent Business Consortium for Sustainable Development (KICS) and has received support through the "SME Asian Environmental Business Development Support Subsidy" program from Kitakyushu's Dalian Office and the Kitakyushu Asian Center for Low Carbon Society. It has been said that the sales of soil remediation agents and the development of solution services with the Kitakyushu's supports led to the success of this bid.²⁷

3 Features of intercity cooperation

Figure 3.1.2 shown at the beginning of this section shows the cooperation framework and agreements between Kitakyushu and Dalian, as well as the achievements from cooperation by field. From this perspective, it can be said that the continuity of cooperation activities for over 40 years and the development across multiple areas are features of collaboration between these two cities.

When viewed by sector, the areas of collaboration have shifted and expanded roughly in order, starting from air pollution control, water supply and sewerage, resource circulation, energy conservation and business support. This means that the problems faced in both cities with similar urban forms were common, with Kitakyushu taking the lead in both problems and solutions, and Dalian

following after. The sharing of knowledge through intercity cooperation is considered to be effective in supporting the improvement of the urban environment in Dalian. As shown in Fig. 3.1.1, improvement was actually observed in the ambient environment. It is inferred that the appearance of visible achievements at a relatively early stage since the start of cooperation was enough to build a trusting relationship between the two cities and to have contributed to the multifaceted development, which subsequently followed.

Based on the needs and interests of both cities, cooperation target areas were significantly expanded through intercity agreements and memorandums of understanding. As soon as intercity agreements and memorandums of understanding were concluded, it appears that cooperation in target fields started to become active. For example, after the conclusion of the friendship city agreement in 1979, pollution courses for cooperation between environmental cities were held. After the submission of the letter of intent on technical exchange in waterworks in 2000, cooperation in the water supply field became active, and following the signing of a memorandum of understanding on cooperation between material-cycle cities between Japan and China in 2006, cooperation on the development of material-cycle cities started promptly.

Another interesting feature of intercity cooperation between Kitakyushu and Dalian is that agreements between Japan and China are linked to agreements at the city level while activities at the city level have influenced consensus between the two countries. One example is the fact that the normalization of diplomatic relations between Japan and China fostered the environment in which a friendship city agreement could be concluded and that the recommendation by Kitakyushu that Dalian become an environmental model city was accepted to be a part of the China's national plan.

The conduct of activities with a focus not only on international environmental cooperation, but also business development can be considered as another feature of cooperation between the two cities. It can be said that it was a logical flow across time to show the environmental technologies acquired in the process of overcoming pollution to Dalian, which required them. In order to further develop this flow to lead to the revitalization of the regional economy, Kitakyushu seems to have aimed at creating and acquiring business opportunities in Dalian centered on local companies. This was accomplished by establishing a local office and becoming involved in international environmental cooperation projects through public-private partnerships to gain the latest information and understand local needs by building wide-area urban networks (The Organization for the East Asia Economic Development) as the city continued to carry out intercity cooperation activities.

²⁵ Consulate-General of Japan in Shenyang, 2016

²⁶ Kitakyushu Industry and Economics Bureau (2009), Opening of the Japan and Kitakyushu Product Exhibition and Distribution Center (Kitakyushu Gallery), PR materials

²⁷ City of Kitakyushu (2017), Local companies win bid for soil contamination cleanup project in China, PR materials

4 Results of intercity cooperation

4.1. Improve the visibility of both cities

Dalian is widely recognized globally as an environmentally advanced city for its efforts to improve the environment, having received the Global 500 Award from the United Nations Environment Programme (UNEP) which recognizes persons and groups of international environmental merit. Kitakyushu also received the Global 500 Award in 1990, making it the first time for friendship cities to both receive the award.

In 2001, the Mayor of Kitakyushu received the "National Friendship Award" from the Chinese government in recognition of the city's cooperation to date. The Friendship Award is offered to foreign nationals that have contributed to the development of the Chinese culture or economy and is the first time that the award has been given to a head of a Japanese municipality.²⁸

When then-Vice President Xi Jinping visited Japan in December 2009, the only other city he visited besides Tokyo was Kitakyushu despite his busy schedule. He toured Yaskawa Electric and received an explanation about the environmental policies of Kitakyushu. A strong wish from the Chinese side, a Chinese newspaper wrote the day after the tour that, "Kitakyushu has extensive experience in environmental protection and the development of advanced technology. This is applicable to China today and is worthy of serious study as a model."²⁹ This visit showed China's stance on promoting science and technology while emphasizing environmental policies to the world, as well as the Chinese government's assessment of Kitakyushu and its high interest in industry. Such recognition at the national level can also be said to be a result of cooperation so far.



Figure 3.1.7. Then-Vice President Xi Jinping visiting Kitakyushu (December 2009)

Source: City of Kitakyushu

4.2. Creation of platforms and projects between Japan and China

The friendly intercity cooperation between Dalian and Kitakyushu is thought to have become the foundation for the creation of platforms and projects between the two countries of Japan and China. The "The Sino-Japan Friendship Centre for Environmental Protection", which was established in Beijing in 1996, is one such example. As the administrative, research, and implementing agency under the direct jurisdiction of the State Environmental Protection Administration (SEPA) of China (which is equivalent to the Ministry of the Environment in Japan), the Centre promotes healthy development and sustainable development strategies for environmental protection projects in China. With the aim of promoting friendship between the people of Japan and China and international environmental cooperation, buildings and equipment were improved with the injection of JPY 10.5 billion in grant aid from the Japanese government and CNY 66.3 million from the Chinese government. Technical cooperation projects to improve the capacity of the center have been implemented over five phases, in addition to the improvement of the facilities. Kitakyushu has also dispatched city officials to the center since it opened and has been providing instruction on analytical techniques and introducing Kitakyushu's activities in the environmental field. The Centre is carrying out activities not only in China, but also in the East Asian region as a base for initiatives to address environmental issues.^{30, 31}

As a project on the platform of The Sino-Japan Friendship Centre for Environmental Protection, the "Japan-China Air Pollution Control City Cooperation

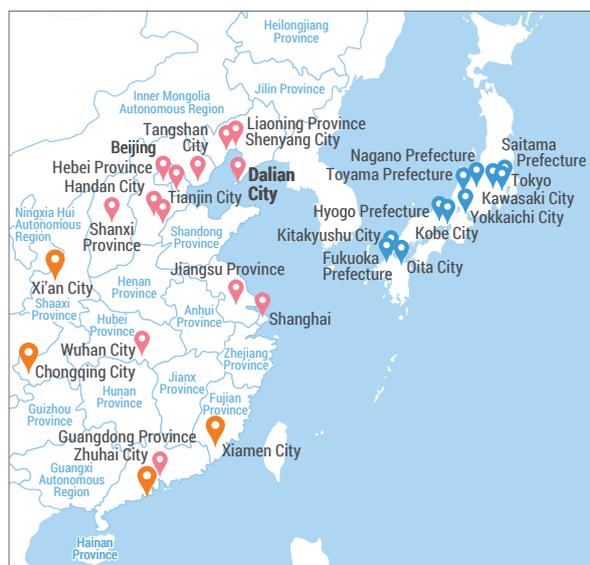


Figure 3.1.8. Local governments participating in intercity cooperation projects on air pollution control in Japan and China

Source: Institute for Global Environmental Strategies, 2017

28 City of Kitakyushu (2018) International environmental cooperation with Dalian (online): http://www.city.kitakyushu.lg.jp/kankyoku/fi/le_0274.html

29 People's Daily (2009) Vice President Xi Jinping observes Kitakyushu City's environmental protection activities and high-tech industries

30 Japan International Cooperation Agency (2016), Organization of the 20th anniversary ceremony of The Sino-Japan Friendship Centre for Environmental Protection, PR materials

31 Ministry of the Environment (2016), Results from the 20th anniversary ceremony of the establishment of The Sino-Japan Friendship Centre for Environmental Protection, PR materials

32 Institute for Global Environmental Strategies (2018), Intercity cooperation project on air pollution control in Japan and China (online): <https://www.iges.or.jp/jp/china-city/>

Project" has been implemented since 2014. This project is being carried out by the Japanese MOE and aims to improve air quality in China by utilizing knowledge, such as that of Japanese local governments in the field of air pollution control, in the development of human resources in cities in China based on the relationship of exchange, such as friendship cities in Japan and China. As shown in Fig. 3.1.8, 11 local governments in Japan, including Kitakyushu, and 17 local governments in China, including Dalian, are participating in the program. As a platform to support this project, activities between cities are being coordinated by IGES in Japan and The Sino-Japan Friendship Centre for Environmental Protection in China.³²

4.3. Improvement of capacity for international cooperation in Kitakyushu

Since Dalian was Kitakyushu's first partner city for international environmental cooperation through intercity collaboration, it is no exaggeration to say that the acquisition of know-how and the gradual development of implementation systems became the cornerstone for subsequent international environmental cooperation activities in Kitakyushu. As stakeholders in Kitakyushu, the presence of KITA, which mainly develops training courses, is significant, and the initial start of almost all of KITA's training courses is through cooperation in each field. It seems that the mechanism of collaboration between stakeholders that initially started with the implementation of projects from training and with the cooperation of private enterprises during the process was developed in Kitakyushu.

Taking into consideration the succession and

improvement of the technical capabilities of staff in the water supply and sewerage field, Kitakyushu is trying to develop initiatives in such a way as to not only contribute to partner cities, but to also be able to enjoy their own merits. It can be said that the fact that such cooperation has been made is an important point in further developing the relationship. In addition, the active movements of the city staff and KITA should not be overlooked. In all aspects of cooperation activities, Kitakyushu has made various proposals and recommendations to Dalian and the national governments of both countries. Participation in intercity cooperation is considered effective for improving the capabilities of city staff, since a positive attitude to solving such problems in an ability that can be utilized even if city officials are transferred to other departments outside of the Environment Bureau.

4.4. Beneficial effects for Kitakyushu

The continuous acceptance of trainees and visitors since the beginning of the 1980s has contributed to the internationalization of the city and led to improvements in the reception base of the city. As part of intercity cooperation, Kitakyushu has also contributed to the revitalization of the city's economy by promoting the business development of local companies. Regular round trip flights (Tianjin Airlines, China) have been in service between Kitakyushu and Dalian since 2016, presumably considering the cities' long-standing cooperative relationship. It is expected that exchange and cooperation that is beneficial for both cities will be further enhanced in the future with the steady stream of traffic between Kitakyushu and Dalian.



Collaboration with Phnom Penh, Kingdom of Cambodia

Phnom Penh, the capital city of Cambodia, is the administrative and economic center of the country, located at the junction of the Mekong, Tonle Sap, and Bassac rivers. The area is 678.46km² with a population of about 1.5 million. With a GDP of USD 820 (2005)¹, Phnom Penh is a growing city that is expected to see an increase in its population and develop economically in the future. Under French rule, Phnom Penh boasted a stunning cityscape but suffered major damage, including to urban infrastructure, as a result of the outbreak of a civil war in 1970.

After the civil war came to an end with the Paris peace agreement in 1991, international support began in earnest, with Phnom Penh making a remarkable recovery. Of these, the results of the rehabilitation of Phnom Penh's waterworks and the development of sound business practices were received to high acclaim as the "Phnom Penh Miracle". The Phnom Penh Water Supply Authority (PPWSA), which is responsible for waterworks in the capital, won the ADB Award, which is given to a top

agency implementing Asian Development Bank (ADB) projects. In 2006, President Ek Sonn Chan of PPWSA was also awarded the Ramon Magsaysay Award, often referred to as the Asian Nobel Prize. Kitakyushu has greatly contributed to improving waterworks in Phnom Penh through technical cooperation.



1 Catalyst for cooperation

Kitakyushu's history of cooperation with Phnom Penh started with the dispatch of staff to PPWSA as JICA short-term experts in 1999.² Staff were dispatched based upon a request by the then-Ministry of Health, Labour and Welfare, which was in charge of water administration, and JICA. As background to the dispatch of experts, waterworks in Kitakyushu had been developed, and it had become difficult for city officials to gain on-site experience laying and extending facilities. In addition to Kitakyushu's desire to contribute to international society, the city intended to link human resources development with an eye on large-scale renewal projects that it would have to deal with in the future by increasing the value of experience for staff at sites overseas.

Following this, Kitakyushu dispatched experts

continuously through a JICA scheme until the end of Japan's technical cooperation project on waterworks in Phnom Penh. Through the implementation of training in the city, Kitakyushu is contributing to the sound development of waterworks in Phnom Penh and laying the foundation for cooperation.



Figure 3.2.1. Prime Minister Hu Senh during his visit to Kitakyushu

¹ Phnom Penh Capital Hall. <http://phnompenh.gov.kh/en/phnom-penh-city/facts/>

² Koro Nakashima (2015), From international technical cooperation to overseas water business: Kitakyushu's challenge. Civil Engineering Consultant Vol.7, April 2015. Special feature 1: Century of Water: Water business changes the world

2 Enhancing cooperation

2.1. Development of cooperation in the water sector

The civil war had a devastating impact on waterworks infrastructure in Phnom Penh. During reconstruction after a peace agreement brokered a cease-fire, the restoration and development of sound waterworks in relation to life and health was a priority issue. In 1993, JICA formulated a master plan on the improvement of waterworks. Improvements to public waterworks in the capital city of Phnom Penh were made based on this master plan, including a water distribution network and water purification plant with international financial assistance from JICA, the French government, World Bank (WB), and Asian Development Bank (ADB), among others. In addition to improving infrastructure, the master plan also contained measures to secure the quality of water supply, restore the functions of the Waterworks Bureau, develop sound waterworks by strengthening organisations and finances, and promote reforms to improve water supply services in the Phnom Penh Waterworks Bureau. When these reconstruction projects came to an end in 1996, the Phnom Penh Waterworks Bureau had a new start as the Phnom Penh Water Supply Authority in July 1997, in accordance with the law on the formation of public corporations.

The next issue following the establishment of the public corporation was to properly operate and maintain facilities, such as improved purification plants, while also strengthening the financial base for waterworks in order to ensure the sustainable provision of water services. Kitakyushu dispatched staff to Phnom Penh for the first time in 1999 to provide technical guidance on the proper operation and maintenance of waterworks facilities. Through the short-term dispatch of experts, the water distribution block system used in Kitakyushu could be introduced and adopted by PPWSA. This system divides the water distribution system into blocks. By understanding the amount of water contained in each block, it is easier to identify where problems are occurring, such as water leakages, and improve efficiency for maintenance and management, such as inspections. The next task PPWSA faced was the continuous collection and management of data. To address this, Kitakyushu proposed monitoring of water distribution using a telemetering system. After a

visit by the President of PPWSA to Kitakyushu and a tour of the system, the Cambodian side solidified their intention to introduce the system. Under the JICA Small-scale Partnership Program³, Kitakyushu carried out studies, dispatched experts, provided its own telemeter equipment that had become redundant due to updates to the system, and maintained computers used for monitoring in order to develop a water distribution monitoring system. PPWSA also bore a similar amount of costs supported under the JICA project for other required equipment and installation costs.⁴

After the system was completed in 2002, it became easier to understand where water leakage and theft was occurring, improve the efficiency of surveys to identify countermeasures, and, in turn, strengthen countermeasures for non-revenue water.⁵ As a result, the non-revenue water rate, which was 72% when the master plan was formulated in 1993, decreased to 20% by 2003. Adding this to the improved storage rate for water fees, PPWSA finances moved into the black.⁶

Following the Small-scale Partnership Program, Kitakyushu dispatched experts to PPWSA for the JICA Project on Capacity Building for Water Supply Systems (Phase 1) between 2003 and 2006 and integrated technical support and the development of human resources with field guidance and training of PPWSA staff in Japan to provide guidance on improvement of water distribution and water quality management capacity, as well as business management.

In 2005, the year before the end of the project, the Cambodian government declared tap water potable in Phnom Penh. In 2006, the year the project ended, the water supply services in Phnom Penh had improved significantly in both quantity and quality, including an increase in the population served by water supply from 25% in 1993 to 92% and an increase in water supply time, which had been about 10 hours per day, to 24 hours a day. In addition to the quality of service of waterworks, the non-revenue water rate, which is a major financial issue, improved to 6.2% (2008). As shown in Table 3.2.1, this is an extremely high standard, as Phnom Penh's non-revenue water rate is much lower than the capital cities of other ASEAN countries, and is lower still than the non-revenue water rate for all waterworks in Japan, which is 9.82% (FY 2013). This remarkable improvement is called the "Phnom Penh Miracle."

Table 3.2.1. Non-revenue water rates in major ASEAN cities⁷

Phnom Penh (Cambodia)	Kuala Lumpur (Malaysia)	Yangon (Myanmar)	Manila (Philippines)	Singapore	Bangkok (Thailand)	Ho Chi Minh (Viet Nam)
6.2% 2008	33.9% 2008	45% 2012	21% 2008	4.4% 2008	42.8% Unknown	42.8% Unknown

* Figures for Manila are actual results from the Manila Water Company Inc. in eastern Manila

3 Current JICA Partnership Program cooperation projects

4 Yasujiro Suzuki, Kyoto Kuwashima (2015). Phnom Penh Miracle: Waterworks reform in Cambodia that surprised the world. Publishing Division, Saiki Printing Co., Ltd.

5 Water that does not provide income from water fees due to leakage or theft, etc.

6 Suzuki, Kuwashima. Ibed.

7 Chiplunkar, Anand, Kallidaikurichi Seetharam, and Cheon Kheong Tan. Good Practices in Urban Water Management: Decoding Good Practices for a Successful Future. Mandaluyong City, Philippines: Asian Development Bank, 2012. Retrieved on October 2017, from <https://think-asia.org/bitstream/handle/11540/1439/good-practices-urban-watermanagement.pdf?sequence=1>

Table 3.2.2 shows the results of technical cooperation by Kitakyushu in waterworks in Phnom Penh from the start of cooperation in 1999 to the end of the JICA Project on Capacity Building for Water Supply Systems (Phase 1). In addition to the high level of awareness of local counterparts, such as the leadership of Mr. Ek Sonn Chan, President of PPWSA, and the high level of ownership of the project, there were a number of places where Kitakyushu's cooperation was essential in improving the waterworks in Phnom Penh, as the city continuously dispatched experts and provided practical local government know-how and technology that was close to the needs of local counterparts under the JICA scheme from 1999 to 2006.



Figure 3.2.2. Scene of a technical cooperation carried out in Phnom Penh

Table 3.2.2. Technical cooperation results of Kitakyushu with PPWSA⁸

Item	Period	Results
Dispatch of individual experts (JICA)	1999-2002	Dispatch of a total of four experts
JICA small-scale development partner projects (Partnership Program)	2001-2002	Dispatch of a total of eight experts
JICA Project on Capacity Building for Water Supply Systems (Phase 1)	2003-2006	Dispatch of a total of 18 experts and acceptance of 20 trainees

2.2. Cooperation framework

Kitakyushu's cooperation in the waterworks field in Phnom Penh, in close collaboration with JICA's waterworks support project in Cambodia, contributed to the "Phnom

Penh Miracle". With Phnom Penh (PPWSA) as a partner, this initiative has been developed to support waterworks projects in other cities throughout Cambodia. Under a strategic partnership with PPWSA to improve waterworks

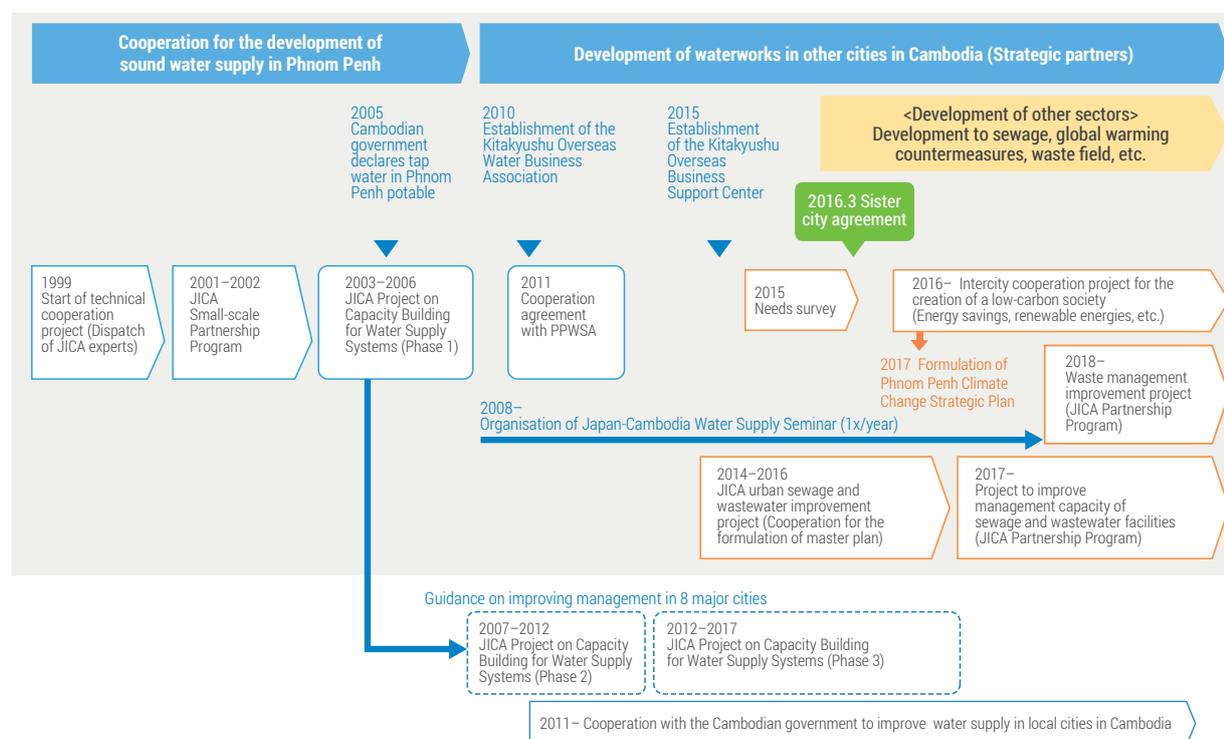


Figure 3.2.3. Transition of the cooperation framework between the cities of Kitakyushu and Phnom Penh

● 2015.12 Order for detailed design for water supply expansion project in Siem Reap (international competitive bid)

⁸ International Project Division, Kitakyushu Water and Sewer Bureau. Project to Improve Management Capacity for Sewage and Water Distribution Facilities in the Capital City of Phnom Penh, Kingdom of Cambodia: Adoption of JICA Grassroots Technical Cooperation Project (Regional Economy Revitalization Special Frame). (Presentation materials from August 26, 2016). <http://www.city.kitakyushu.lg.jp/fi/les/000745850.pdf>

in Cambodia, Kitakyushu, PPWSA, and other cities in Cambodia concluded a memorandum of understanding in 2011.

In response to a suggestion that the cooperative relationship be further expanded in the water sector of Phnom Penh during a visit by Prime Minister Hun Sen of Cambodia in 2015 to Kitakyushu, which had produced good results to date, the Mayor of Kitakyushu and the Governor of Phnom Penh concluded a sister city agreement in March 2016. As a result, the cooperative relationship between Phnom Penh and Kitakyushu has shown further development in other areas, such as sewage, waste, and energy.

3 Development of cooperation areas

3.1. Expansion to sewage sector

Improvements to the sewer works in Phnom Penh is far behind that of public waterworks. As urbanisation rapidly gains speed, problems have bubbled to the surface, such as declining water quality in rivers, generation of offensive odors and mosquitos from rivers with worsening water quality, and deterioration of the hygienic environment during floods. The improvement and maintenance of sewage and drainage facilities in cities, including Phnom Penh, have also been positioned as priority areas in the Cambodian National Strategic Development Plan (2014–2018) and countermeasures are urgently needed.

In response to the need for improvements to sewage works, Kitakyushu provided training for staff in sewage works in the national and local governments in Cambodia in fiscal 2013 and offered their cooperation in the formulation

of a master plan on sewage works for Phnom Penh in JICA's Study on Drainage and Sewerage Improvement Project in the Phnom Penh Metropolitan Area, with a target year of 2035. Kitakyushu Water Service Co., Ltd.,⁹ in which the City of Kitakyushu owns a stake, also participated in the formulation of this master plan.

In response to this, Kitakyushu proposed the development of the "Study on Drainage and Sewerage Improvement Project in the Phnom Penh Metropolitan Area JICA Partnership Program (Regional Economy Revitalization Special Frame) to JICA. The project was adopted in August 2016 and implementation started in February 2017. At the start of the project, a "Memorandum of Understanding on Technical Cooperation in the Sewerage Field" was signed between the Kitakyushu City Water and Sewer Bureau and the Department of Public Works and Transport, Phnom Penh Capital City (DPWT). In this initiative, projects aiming to raise the awareness of local residents and the development of maintenance and management manuals for wastewater facilities are to be implemented in cooperation with the Kitakyushu Overseas Water Business Association. Specific plans include the implementation of training programs for practitioners in Phnom Penh who have worked with NPOs and universities in the city and the dispatch of experts.

3.2. Development in other environmental areas (waste and energy)

In addition to water and sewage works, the Environment Bureau (Asian Center for Low Carbon Society) conducted a needs assessment for Phnom Penh in fiscal 2015 using municipal expenditure, with a focus on developing environmental business in the city. Based on the results, a survey aiming at the formation of low-carbon projects was carried out in fiscal 2016 using the intercity cooperation

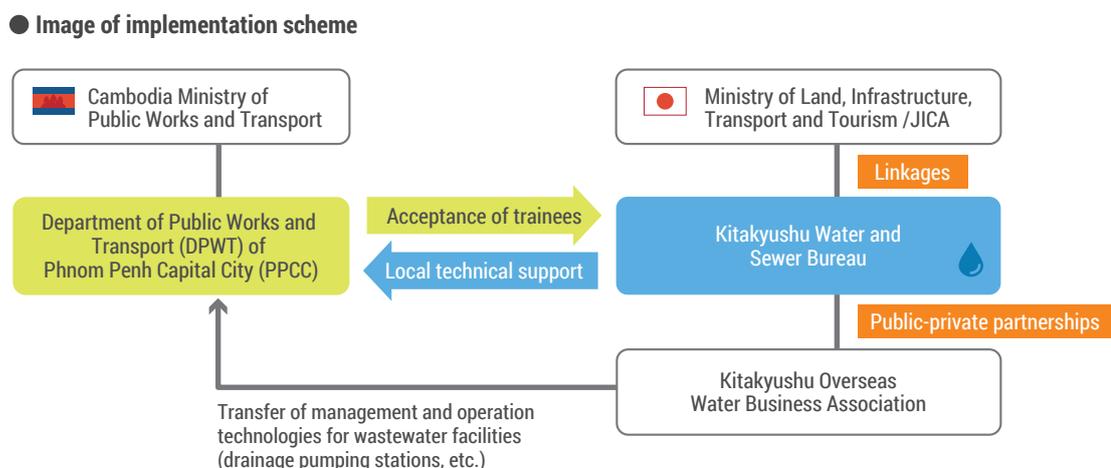


Figure 3.2.4. Image of technical cooperation for sewerage systems under the JICA Partnership Program¹⁰

⁹ Organisation established in 2015 as a joint investment by the City of Kitakyushu and six private companies with the Kitakyushu Sewage Works Association as the parent body carrying out maintenance and inspections of water and sewage works in Kitakyushu. The organisation's philosophy is to be a "new leader supporting the development of water and sewage works and the creation of a rich water environment in Japan and abroad with the City of Kitakyushu", with the promotion of Kitakyushu's overseas water business also positioned as one of its responsibilities. (Kitakyushu Water Service Co., Ltd. website: <http://www.kitakyuws.co.jp/company/>)

¹⁰ Conclusion of a "Memorandum of Understanding on Technical Cooperation in the Sewerage Field" with the Capital City of Phnom Penh in Cambodia: Start of full-scale technical cooperation in the sewerage field with Phnom Penh. PR reference materials of the International Project Division, Water & Sewer Bureau, on February 10, 2017.

project scheme of the Ministry of the Environment, with a goal of promoting low-carbon development in Asian cities through intercity cooperation. In this survey, stakeholders shared information on the current situation and challenges in the target area, vision, and direction of measures through individual consultations with the government, companies, and universities, as well as workshops to formulate the “Phnom Penh Climate Change Strategic Plan”, which includes measures in individual areas and examples of pilot projects. To achieve the targets set in this plan, the Kitakyushu Asian Center for Low Carbon Society is carrying out a study on the potential to utilise waste heat from large-scale plants, EV tuk-tuks, and introducing recharging systems utilising renewable energy by applying the intercity cooperation project of the Ministry of the Environment in fiscal 2017 and 2018. In addition, a cooperation project to improve waste issues in Phnom Penh was adopted as a JICA Partnership Program in 2018. This project is scheduled to be carried out for three years in collaboration with related organisations, such as the Kitakyushu International Techno-cooperative Association (KITA), Kitakyushu City Environmental Preservation Association, and Hibikinada Development Co., Ltd., among others. Technical guidance is being provided to improve problems through the reduction of waste by raising public awareness in the model area and through the proper management of the final disposal site.



Figure 3.2.5. Scene of a survey carried out in Phnom Penh

3.3. Industrial and economic field¹¹

In the industrial and economic field, a project to formulate a system to develop industrial human resources in Phnom Penh led by The University of Kitakyushu started in 2017 and is scheduled to run for three years, with the aim of increasing the income of residents through the advancement and diversification of industry. Here, the formulation of activities, such as the creation of textbooks and instruction manuals for vocational training schools and industrial high schools that train industrial human resources and the introduction of a PDCA cycle to improve

the quality of teachers, training for staff from national agencies that are responsible for developing industrial human resources at The University of Kitakyushu, and the preparation of guidebooks linked with course evaluations and studies on the degree of understanding are carried out under the guidance of experts from Kitakyushu.

4 Results of cooperation

4.1. Roll-out of the “Phnom Penh Miracle” to other cities in Cambodia

The results of cooperation in the water supply field in Phnom Penh are significant in that it has improved water supply services in Cambodia, which is positioned as a least developed country (LDC), to a level similar to that of developed countries and has had a major impact internationally, as mentioned above. In addition to this, the remarkable achievements brought about by the cooperative projects in Phnom Penh are leading to the horizontal expansion to regional cities in Cambodia in cooperation with PPWSA and based on the results of the waterworks project in Phnom Penh.

Kitakyushu is providing technical support, including the dispatch of experts, with an aim to enhance the operation, maintenance and management of waterworks facilities, formulate management plans to achieve independent water supply management and improve management capacity for the development of human resources in eight regional cities in Cambodia (Siem Reap, Battambang, Kampong Cham, Kampong Thom, Kampot, Pursat, Sihanoukville, Svay Rieng) under Phase 2 and Phase 3 of the JICA Project on Capacity Building for Water Supply Systems implemented from 2007 to 2017. At the end of the project in 2017, 27-hour water supply was achieved in the eight target cities and the quality of tap water improved



Figure 3.2.6. Eight cities in Cambodia where Kitakyushu has developed cooperation¹²

11 JICA Knowledge Site <http://gwweb.jica.go.jp/KM/ProjectView.nsf/1751c21d3ce7d90a49256bf300087d04/5501015b41d62761492581be0079ee26?OpenDocument>
The University of Kitakyushu. Training industrial human resources in Cambodia! Using the JICA Partnership Program: Organization of the kick-off meeting. (News release, December 21, 2017)

12 International Project Division, Kitakyushu Water and Sewer Bureau. Implementation of a new technical cooperation project in Cambodia. (Press release on November 18, 2012) <http://www.city.kitakyushu.lg.jp/fi/les/000127019.pdf>

through changes to water quality testing. In addition, the non-revenue water rate of each city also improved significantly (Table 3.2.3) and succeeded in moving the waterworks into the black in all eight target cities. Again, it can be said that cooperation has been carried out that takes advantage of the know-how of municipalities,

such as the operation, maintenance and management of water supply services. As mentioned earlier, PPWSA is also taking part in the project together with Kitakyushu, which illustrates a good example of a cooperative and collaborative relationship between two cities that has spread out horizontally to other cities.

Table 3.2.3. Non-revenue water in 8 regional cities in Cambodia supported by Kitakyushu (public water utility)

	Battambang	Kampong Cham	Kampong Thom	Kampot	Pursat	Svay Rieng	Sihanoukville	Siem Reap
2013	20%	11%	15%	18%	16%	13%	17%	13%
2015	11%	9%	11%	11%	11%	10%	13%	8%

Source: Ministry of Industry and Handcraft, Cambodia

4.2. Development of Kitakyushu international water business

The successful experience in international and intercity cooperation in Phnom Penh is also an important point in that Kitakyushu's cooperation activities in the fields of water and sewage works have transformed into the development of international water business and achieved satisfactory results.

In 2010, the government launched support for the development of overseas infrastructure using a new growth strategy. That same year, Kitakyushu established the "Kitakyushu Overseas Water Business Association", which aims at the business development of water and sewage works overseas, the first in the country to do so. As of September 2017, 141 companies, including corporate members from Kitakyushu (79 companies) and outside of Kitakyushu (62 companies), have participated,¹³ as well as related national organizations (JICA, JBIC, GCUS, other). The association's main activities are to understand the seeds and needs of private companies, study local needs overseas, exchange and share information mutually with members and related organisations, and examine and promote techniques for overseas development through public-private partnerships and the formation of concrete proposals. In addition to construction consulting, civil engineering construction, plant equipment, machinery and equipment manufacturers, water/sludge treatment, information processing, and maintenance, management and operation, the industries participating are diverse, including finance and think tanks. Since 2008, the association has been involved in continuously creating business opportunities in Cambodia, organising the "Japan-Cambodia Water Supply Seminar" each year together with the City of Kitakyushu and the Japanese government (Ministry of Health, Labour and Welfare and Ministry of Land, Infrastructure and Transport), which is co-sponsored by the Cambodian government and Phnom Penh.

As a concrete example of results in the water business, in 2011, the Water and Sewer Bureau received orders to enhance the basic design of the Siem Reap water purification plant to be implemented together with member companies of the Kitakyushu Overseas Water Business Association. As a result of support to improve the capacity of the Siem Reap Water Supply Authority using the JICA Partnership Program and international competitive bidding for the "Detailed Design for a Water Supply Expansion Project in Siem Reap", a joint venture company formed with the City of Kitakyushu and the members of the Kitakyushu Overseas Water Business Association in December 2015 received an order for a contract of approximately JPY 800 million (total cost of expansion project is JPY 7.16 billion).¹⁴ Kitakyushu is responsible for offering guidance on the design, operation, maintenance and management of the water transmission facility. This is the first order received as an international competitive bidding project under the overseas water business in Kitakyushu.

In January 2011, the Japanese Ministry of Health, Labour and Welfare and the Cambodian Ministry of Industry, Mines and Energy concluded a "Memorandum of Understanding on the Safe Supply of Water". In order to promote the safe supply of water in Cambodia, the water utilities and industries in both cities will work in close cooperation, and Kitakyushu, which has a proven track record in international contributions to the water supply field in Cambodia, will coordinate and formulate specific measures. As a result, the groundwork for local governments (=Kitakyushu) to directly participate in local water supply projects was set. In December 2011, in response to a request from the Cambodian Ministry of Industry, Mines and Energy, which has jurisdiction over local public water supply services, Kitakyushu signed a "Memorandum of Understanding on Basic Water Supply Plans for Nine Major Cities" with the ministry. The MoU clearly stipulated that Kitakyushu will offer consulting services on the formulation of water supply basic plans for

¹³ Website of the Kitakyushu Overseas Water Business Association: http://kowba.jp/?page_id=28

¹⁴ International Project Division, Kitakyushu Water and Sewer Bureau. Order for the detailed design of a water supply expansion project in Siem Reap: First order from an international competitive bidding project for Kitakyushu's overseas water business. (December 16, 2015, Press release): http://www.city.kitakyushu.lg.jp/ri_les/000758688.pdf

four years with the aim of improving water supply rates in the nine cities of Kampot, Battambang, Kampong Cham, Kampong Thom, Mondulhiri, Pursat, Preah Sihanouk, Svay Rieng and Kep. Table 3.2.4 shows the results of cooperation with target cities.

In 2015, the Kitakyushu Overseas Business Support Center was established within PPWSA to set up a base for the business development of local companies in Cambodia, including Phnom Penh. In January 2016, the

City of Kitakyushu, Kitakyushu Overseas Water Business Association, and the Cambodian Ministry of Industry and Handicraft signed a “Memorandum of Understanding on Activities to Achieve Sustainable Development in Water Supply in the Kingdom of Cambodia”, which confirmed that Kitakyushu will continue to promote cooperation in Cambodia together with the public and private sectors in order to achieve Cambodia’s targets of “promoting water supply to all Cambodian people in urban areas by 2030”.

Figure 3.2.4. Results of city activities in the 9 major cities¹⁵

City	Implementing year	Details of activities
Kep	2012	Introduction of mobile waterworks (grant aid)
Battambang	2012–2016	Improvement of waterworks (grant aid)
Kampong Cham		
Sihanoukville	2011–2013	Updates and extension of water distribution network (grant aid)
Mondulhiri	2012–2016	Improvement of Waterworks in Sen Monorom (Japan-ASEAN Integration Fund) * The Cambodian Ministry of Industry and Handicraft requested Kitakyushu to provide consultancy services for the basic design, implementation design, and guidance on operation for equipment for the purification plant and drainage pipe network that are targets of the project. This is the first time that a local government has received a direct contract.
Kampot	2013–	Improvement of waterworks (grant aid)
Pursat	2017–	Improvement of waterworks (grant aid) * Implemented as a result of competitive bidding on the basis of cooperation between the public and private sectors, including receiving an order to conduct a “survey on Svay Rieng for the preparation of an expansion improvement plan for water supply in Pursat and Svay Rieng.”
Svay Rieng		
Kampong Thom	-	Not implemented

4.3. Improvement of Kitakyushu’s international visibility: Contribution to the Kitakyushu brand

Kitakyushu’s cooperation in the water supply project in Phnom Penh has made significant contributions to the promotion of stable water supply in Cambodia. As a result of this cooperation, Kitakyushu was awarded the “Grand Cross”, a medal of friendship under the name of the King of Cambodia in 2011. Kitakyushu has earned high marks as well, receiving commendation from the Japanese Minister of Foreign Affairs for the results of cooperation in waterworks in Cambodia in 2012 and the introduction of its involvement in the waterworks project in Phnom Penh as a case contributing to the SDGs at an event organised by the Japanese government at the UN’s High-Level Politician Forum, organized in New York in the United States in July 2017, where the progress of the Sustainable Development Goals (SDGs) were discussed. In addition, the development of Kitakyushu in the water supply project in Phnom Penh and other cities in Cambodia is also referred

to as an example of overseas water business development in Japan. These types of assessments from Japan and overseas can be said to have contributed to enhancing the international recognition of Kitakyushu.

4.4. Development at the civic society level

Kitakyushu organises seminars to widely disseminate the results of intercity cooperation to residents. In 2017, as a new development, Kitakyushu planned a “Training Course to Promote Understanding by Young Human Resources in Water and Sewage Works”, in which six select local high school students in Japan applied to take part. At the training in Cambodia, the students visited Phnom Penh and Siem Reap, cities that achieved results in the waterworks project, and visited the sites of the cooperation project. After their return home, they took part in a public seminar attended by the Mayor of Kitakyushu, where they presented the results from their training. This type of training is significant from the perspective of the

¹⁵ International Project Division, Kitakyushu Water and Sewer Bureau. Order for overseas water business project: Start of grant aid project by a joint venture, including the City of Kitakyushu. (May 22, 2017, Press release): <http://www.city.kitakyushu.lg.jp/finance/000769664.pdf>

development of human resources that will be responsible for international cooperation and intercity collaboration in the future and is effective as an opportunity to learn about Kitakyushu's international cooperation and collaboration projects overseas that may be less familiar. The content of this training was also taken up as a series in the local newspapers, resulting in making the name of Kitakyushu well known.



Figure 3.2.7. Experiencing the Phnom Penh Miracle at training to promote understanding by young human resources in water and sewage works

5 Conclusion

Collaboration between Phnom Penh and Kitakyushu in the water supply project in the city has left behind results that have received high acclaim on the international stage. The human networks and mutual relationship of trust developed through cooperative projects have led to partnerships in waterworks projects in other cities in Cambodia and the creation of opportunities for international water business, contributing not only to

Cambodia, but also acting as testimony to the technical capabilities of Kitakyushu in international water business in developing countries and strengthening Kitakyushu's brand power in international cooperation projects. Factor of success for Kitakyushu in the water supply project in Phnom Penh and Cambodia include the continuous dispatch of experts overseas even with limited human resources, even when it was not always easy, and the development of human resources that are responsible for technical cooperation and international water business (continuity of cooperation and development of human resources responsible for intercity cooperation), ensuring cooperation over the long term through external funds rather than municipal expenses through close collaboration with JICA (securing external funds), encouraging companies to take part as cooperation progresses and quickly establishing a system that integrates the know-how of both cities and companies (creation of a cooperation system where the public and private sectors work together). It is also important, within ongoing cooperation, to promote cooperation that is needed by counterparts (needs-based cooperation). Although the management of the water supply business in Phnom Penh is on track, large-scale repairs and refurbishments are expected to be required in the medium to long-term, just like Japan. Therefore, Kitakyushu will need to be involved in the management of Phnom Penh's sound waterworks in the future as a strategic partner. In addition, as a result of the establishment of the sister city agreement in 2016, cooperation is spreading rapidly to collaborative projects in other areas of Phnom Penh. It is expected that the sustainability of Phnom Penh as a whole will improve through the enhancement and development of collaborative relationships, such as in response to the increasing number of environmental problems in Phnom Penh, which is continuing to grow.



Collaboration with Surabaya, Republic of Indonesia

The capital city of East Java Province, Surabaya is the second largest city in Indonesia with a population of approximately three million. The largest industrial park in the country has been developed in Surabaya due to the presence of a market second only in scale to that in the capital of Jakarta and the existence of logistics infrastructure, including the international Port of Tanjung Perak, Juanda International Airport, and railway networks. Among these, Pasuruan Industrial Estate Rembang (PIER) is home to a number of Japanese companies who have made inroads into the city and is attracting attention as a destination for investment.

Surabaya has long held an interest in improving the environment. In response to their efforts, Surabaya received the “Global 500”¹ award from the United Nations Environment Programme (UNEP) in 1990 and the “UN Local Government Honours”² at the United Nations Conference on Environment and Development held in Rio de Janeiro in 1992. However, from the late 1990s to the early 2000s, Surabaya faced a serious crisis from piles of

garbage around the city due to an increase in the amount of waste from its growing population and the closure of the final disposal site. Surabaya took this opportunity to collaborate with Kitakyushu, working together as a team trying out various environmental improvement initiatives to high acclaim from both home and abroad, with the result that Surabaya has become the most environmentally-advanced city in Indonesia.



1 Catalyst for cooperation

The cities of Kitakyushu and Surabaya have interacted on an informal basis since the early 1990s. As a starting point, Professor Johan Silas from the Institut Teknologi Sepuluh Nopember in Surabaya visited Kitakyushu to inspect the city's policies. In 1993, an international conference on “Improvement of the Urban Environment in Asia”, organised by the United Nations Centre for Regional Development (UNCRD), World Bank, and City of Kitakyushu, was held in Kitakyushu where the case studies of both cities were introduced. Using this opportunity, seminars organised by the World Bank were held continuously over a period of two weeks in Penang (Malaysia) and Kitakyushu, where representatives from both cities took part and exchanged information. This personal exchange gave rise to the Conference on Environmental Cooperation among Asian Cities held in Kitakyushu in 1997, which sparked

the start of more formal intercity exchange. At that meeting, Kitakyushu invited six cities from four countries in Southeast Asia that were interested in environmental improvement to form the “Environmental Cooperation Network of Asian Cities”. One of those cities was Surabaya. In 2000, the Ministerial Conference on Environment and Development of the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) was held in Kitakyushu, where the Kitakyushu Initiative Network (now, the Organization for City-to-City Environmental Cooperation in Asia) was created, which also included Surabaya. Taking advantage of these interactions, exchange and cooperation activities gradually developed, starting with Kitakyushu accepting trainees from Surabaya and the adoption and implementation of projects under the JICA Partnership Program on waste, which started in 2000. Kitakyushu was also tapped as the first municipality to take part in “project formation studies” under the Japan Bank for International Cooperation (JBIC) in 2002.

1 UNEP Global 500 Award: Award system of the United Nations Environment Programme (UNEP) that recognises individuals and groups that have contributed to the protection and improvement of the environment, which is the foundation of sustainable development. Kitakyushu received this award in the same year.

2 UN Local Government Honours: Award presented at the UN Conference on Environment and Development (“Earth Summit”) held in 1992 to municipalities selected by UNEP that are involved in advanced environmental issues around the world. Kitakyushu received this award at the same time.

2 Enhanced cooperation

2.1. Cooperation framework

Between 1997 and the latter half of the 2000s, after the official start of intercity exchange, a relationship of trust was established as environmental cooperation projects, primarily on waste treatment and improvement of the water environment, continued to be implemented step-by-step together with the acceptance of trainees. With these achievements as a basis, both cities announced a “Joint Statement on Strategic Environmental Partnership” in March 2011 to further strengthen their cooperative relationship and broaden the range of business areas and collaborative activities, aiming at actual business development. In addition, the cities concluded a “Memorandum of Understanding on Green Sister Cities” as a comprehensive agreement in November 2012 (Fig. 3.3.1). This memorandum aims to package and export technologies and products in various sectors, such as waste, water and sewage works, energy, and urban development based on earlier partnership activities between the two cities. The MoU is renewed every three years, with the first renewal occurring in September 2016 and running to the present.

Under the Green Sister Cities agreement, the International Cooperation Division in Surabaya was designated as a contact point, which means that all exchange and collaborative projects are communicated with other relevant departments through this office, regardless of the area of cooperation. The contact point for Kitakyushu is the Asian Center for Low Carbon Society.

In addition, collaboration projects with Surabaya include the participation of various actors, such as local companies aiming at business development, the Kitakyushu International Techno-cooperative Association (KITA), Kitakyushu Urban Centre of the Institute for Global Environmental Strategies (IGES), and The University of Kitakyushu, as well as many others. This is described in Chapter 2.



Figure 3.3.1. Signing ceremony for the Memorandum of Understanding on Green Sister Cities

Source: City of Kitakyushu, “Initiatives with the City of Surabaya, Indonesia”

2.2. Enhancing cooperation

Fig. 3.3.2 shows the main projects by sector that Kitakyushu has collaborated with Surabaya over the past 20 years since 1997, when official intercity exchange began. As seen in the figure, collaborative projects first continued with the use of subsidies from Kitakyushu and external funds, mainly for the exchange of human resources, such as the acceptance of trainees, and waste projects. However, initiatives in the water resources sector were added from fiscal 2007 and, along with the addition of the energy sector, there was a sudden expansion where multiple projects were developed simultaneously in parallel, including traditional waste and water resources sectors, based on the “Joint Statement on Strategic Environmental Partnership” in 2011 and the Green Sister Cities partnership in 2012. The public sanitation sector was also added after fiscal 2015. In the background of the rapid expansion of projects from 2011 to 2012 is the belief that the increase in opportunities for various overseas cooperation projects using public funds was also affected by the decision of the Cabinet on the “New Growth Strategy” in 2010 and clarification of support for the development of infrastructure overseas and the entry of private companies and NPOs. In response to such trends in Japan, Kitakyushu formulated the “Kitakyushu New Growth Strategy” in 2013, in which the promotion of urban infrastructure business development to Asia was positioned to support the expansion of intercity collaboration projects.

It can be said that the strongest factor behind Kitakyushu and Surabaya continuing and developing intercity cooperation for 20 years was the connection between the people of both cities and the relationship of trust. In addition, the essence of the relationship of trust is not one-sided control, but rather the respect Kitakyushu has for the culture, traditions, and customs of the partner city and the emphasis on the attitude of promoting cooperation in a style that is suited to this idea and also stretches the other city’s “independence and autonomy”. However, the other side is a bit drier—that is, the fact that Kitakyushu excelled in using external funds was also a factor that had led to a long-lasting cooperative relationship. In addition to an independent budget for overseas travel for city staff that are involved in intercity cooperation activities, mainly for the Asian Center for Low Carbon Society, Kitakyushu also has its own sources of funding to support the overseas development of local companies through a subsidy to support small- and medium-sized enterprises develop environmental business in Asia. However, the majority of activity expenses for cooperation projects mainly utilize subsidies from the Japanese government. The Asian Center for Low Carbon Society has detailed knowledge on how to acquire and use these external funds and provides consistent support, from identifying suitable external funds according to the sector and needs of local companies, studies on the trends of each external

fund and coordination with donors, support for filling out application forms, and contact between Surabaya and external consultants, to participation as external human resources (experts) in projects and supervision of reports.

The continued and expanding collaborative initiatives over the past 20 years can be said to be the result of such warm support from the city.

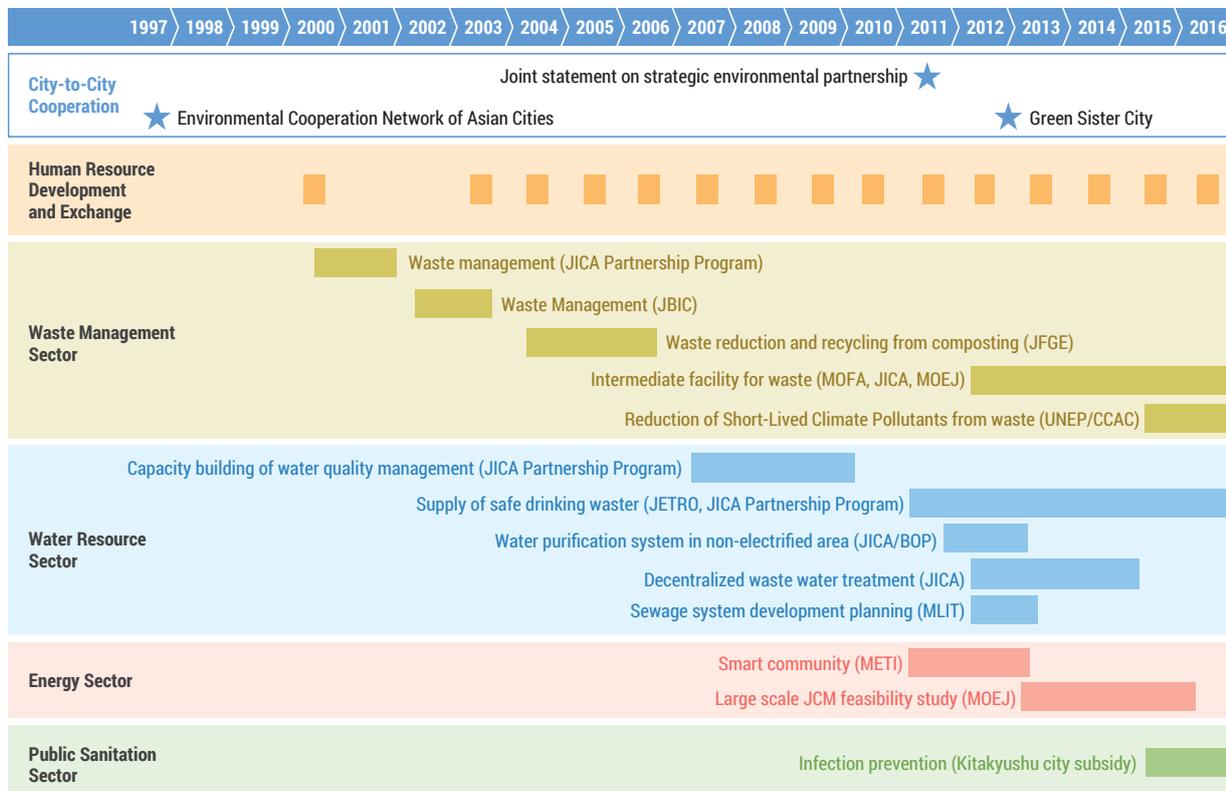


Figure 3.3.2. Schematic drawing showing transitions of major collaborative initiatives by sector between Kitakyushu and Surabaya

(Note) Years when human resources development and training were carried out are shown schematically.

3 Development of cooperation sectors

This section specifically describes how the collaborative projects of both cities developed in the project areas shown in Fig. 3.3.2.

3.1. Human resources development and training

The Memorandum of Understanding on Green Sister Cities contains details on cooperation for the development of human resources. There is an extensive record of collaboration between the two cities in the training of human resources focusing on administrative officials in Surabaya, with Kitakyushu accepting trainees from Surabaya each year. A large number of trainees have been accepted from Surabaya since the first training course in 2000. Training mainly utilises the programs of JICA and

the Council of Local Authorities for International Relations (CLAIR). From short-term training lasting from about one week to courses that last about six months, Surabaya city staff are dispatched to Kitakyushu where they work together to improve capacity. Each time a course was held, Surabaya also started to focus on the effects of the training in Kitakyushu, until the mayor herself started to select the staff that would be dispatched for training. Kitakyushu also strategically used the trainings as a chance to generate a synergistic effect with projects and avoid them ending merely as opportunities for human resources development by sending requests to Surabaya to invite departments and personnel in a way linked with ongoing projects. As activities continued to stack up, a group of trainees comprising city heads and other staff (city officials) was dispatched to Kitakyushu using Surabaya's own municipal budget for the first time in 2017. In addition to these types of training opportunities, various intermittent and multi-layered opportunities for people to interact were

continuously developed, such as field visits to Kitakyushu by groups of council members from Surabaya and the mayor making plans to travel to Kitakyushu when visiting Japan.

These types of long-term human resource development and exchange activities have greatly influenced the policies of Surabaya. For example, Mayor Tri Rismaharini, who became the mayor of Surabaya in 2010, won the election (re-elected in 2016 and currently in her second term in 2018) after serving as the head of the Landscape and Cleanliness Department in 2005 and the head of BAPPEKO (Development and Planning Department) in 2008. Since she has a history of being directly involved in the practice of collaborative projects with Kitakyushu during her time as director of these departments, she continued to focus on collaboration with Kitakyushu even after being elected mayor. In addition, a number of city council members and senior officials in Surabaya have also been involved in several collaborative projects with Kitakyushu and have visited the city, which makes the likelihood that such ripple effects can be expected in the medium to long-term future.

3.2. Waste sector

3.2.1. Takakura Method of composting^{3,4,5}

Waste in Surabaya has been steadily increasing as the population grows. Around the time that Keputih, one of the two final disposal sites, closed in 2001, waste generated in the city was not collected and had developed into a crisis situation as waste overflowed onto the streets of the city. Against this backdrop, KITA collaborated with a local NGO (PUSUDAKOTA) for three years from 2004 to improve the community waste management system using a subsidy from the Japan Fund for Global Environment.

At that time, Surabaya worked to reduce waste and promote recycling with the implementation of a “Green and Clean” campaign from 2005, as a mechanism to improve community sanitation and hygienic conditions. As part of this initiative, Surabaya set up compost centres, distributed composting baskets, promoted the spread of waste banks, placed local environmental leaders in communities, and carried out beautification campaigns, but to limited results.

Under these conditions, a method was developed based on a conventional composting technique (windrow method) for organic waste used by PUSUDAKOTA to increase fermenting speed by cultivating fermenting bacteria from local fermented foods, rice bran and rice husks and mixing it with shredded waste. As a result, the composting process, which traditionally takes about three months, could be shortened to one or two weeks. This method was referred to as the “Takakura Method of composting” in association with the name of one of the experts dispatched from KITA (Fig. 3.3.3.). With this method, waste collected from 1,000 households in the surrounding area could be composted in a concentrated

manner at PUSUDAKOTA's facilities. This technique has also been adapted for household use, with composting containers (baskets) distributed to residents so they are able to compost waste generated in the home on the spot and use the compost as fertilizer for gardening at each household. PUSUDAKOTA also incorporated the “waste bank”⁶ system, which is being expanded to various parts of Indonesia by Unilever Indonesia to introduce a mechanism to return revenue to residents by collecting valuable recyclable materials, such as plastic, bottles and cans that have been separated at source for sale to recycling companies. As a result, a model for separation and recycling has been established at the community level using organic waste and resource waste as a set.



Figure 3.3.3. Mr. Takakura (centre) explaining about the Takakura Method of composting

Surabaya, which witnessed reductions in waste and the effects of beautification and greening of the city as a result of these efforts, immediately introduced the composting technology for the Takakura Method to the city's composting centre and treated organic waste generated from markets, streets and parks in a concentrated way at new composting centres constructed in succession in the city. Then, a recycling model was established utilising the compost produced to green the city's streets and parks. Following this, the number of composting centres has gradually increased to 25 as of 2015 (according to confirmation by author).

In addition, Surabaya distributed household composting baskets free of charge to residents who wanted them, handing out composting baskets to over 19,000 households between 2004 and 2009. These household composting containers were distributed by women's groups and NGOs with close relations to the area and a system was launched where technical support could be provided by existing local environmental leaders. As a result of these synergistic effects, the Green and Clean campaign has evolved into a major event celebrated in the city, where the community takes on the greening and beautification of the city.

As a result of these efforts, the amount of waste

3 Toshizo Maeda (2010). Reducing Waste through the Promotion of Composting and Active Involvement of Various Stakeholders: Replicating Surabaya's Solid Waste Management Model. IGES Policy Brief No.9, April 2010.

4 Premakumara, D. G. J. (2012). Kitakyushu City's International Cooperation for Organic Waste Management in Surabaya City, Indonesia and its Replication in Asian Cities

5 Koji Takakura (2016). Research on technology transfer of the Takakura Method of composting through overseas technical cooperation. Graduate School of Life Science Systems Engineering, Kyushu Institute of Technology. Doctoral degree dissertation, FY 2016.

6 Waste banks: System of purchasing resource waste from households for delivery to recycling companies. The market value equivalent for resource waste is recorded in a “deposit passbook”, similar to a bankbook, and customers can receive cash after a certain period of time. Waste banks are becoming popular throughout Indonesia and customers can exchange their deposits for insurance, medical fees, and daily goods, in addition to cash.

transported to the final disposal site, which exceeded 1,500 tonnes/day until 2005, was reduced by 30% over five years. Cooperation with Kitakyushu mainly consisted of the development of appropriate technology (Takakura Method) to fit with actual local conditions and to show concrete effects through demonstrations. Since this successfully coincided with the activities (Green and Clean campaign) already carried out by Surabaya, it is considered to be a good example of drawing the attention and motivation of the administration and residents, spreading throughout the city to dramatically reduce the amount of waste and lead to the greening and beautification of the city.

3.2.2. Intermediate treatment of waste^{7,8}

Nishihara Corporation, a local company in Kitakyushu, is engaged in the collection and transport of general business waste and waste management systems and services in Japan. At the invitation of Kitakyushu, the company had originally examined the commercialisation of a waste management system for the Special Capital Region of Jakarta. But from 2012, Nishihara started a project on the separation and recycling of waste with a subsidy from the Ministry of Foreign Affairs in Surabaya, where there was already a foundation for cooperation with Kitakyushu in place. As part of this, an intermediate treatment facility called Super Depo was constructed in 2013 and started operations. Waste pickers (or scavengers) were hired to sort waste into valuables, such as plastics and cans, and organic waste, and the company set about developing a model to sell valuables to recycling companies. The results of a survey showed that about 60% of general waste is organic and it is essential to recycle this waste in order to reduce the total amount of garbage. With a subsidy from a JICA Verification Survey with the Private Sector for Disseminating Japanese Technologies, the potential for producing and selling compost produced from organic waste has been studied since 2013. In 2014, the Wonorejo composting centre was constructed, which accepted 20 to 40 tonnes of organic waste per day from markets, launching the production of composting. The demonstration showed that waste could be reduced by 75% by collectively treating the organic waste separated at the Super Depo at the Wonorejo composting centre. A sales channel to sell compost to business operators was also developed, with the operation of the facility and employment of staff covered by the profit of sales from compost (Fig. 3.3.4).

The pilot facility established with JICA's support was to be transferred to Surabaya after the project was completed. Since it was not possible to utilise the advantages of scale at 20 to 40 tonnes of waste per day and it did not fully develop as a business, a feasibility study was carried out in 2016 under the adoption of an Incubation and Overseas Promotion of Waste Management and Recycling Industry scheme by the Ministry of the Environment to examine the



Figure 3.3.4. Super Depo (top) and Wonorejo composting centre (bottom)

Source: City of Kitakyushu, "Initiatives with Surabaya, Indonesia"

potential of a composting centre to process 100 tonnes of waste or more per day. For the time being, studies are underway looking in the direction of verification tests by changing the location to another city (Balikpapan), where faster commercialisation is expected.

Although Nishihara Corporation's recycling and composting projects have not yet reached a level of self-sustained commercialization, the projects have ended up creating a good image for the informal waste business, which has traditionally been avoided locally, as one that is environmentally-friendly. The potential impacts demonstrating that a project has been established are considered to be significant if a separation, collection and recycling model can be developed on a project scale and there is income from tipping fees paid when carrying waste into final disposal sites. Surabaya has led the construction and operation of an intermediate waste treatment facility based on the Super Depo, using Nishihara Corporation's recycling and composting business as a model.

3.2.3. Other waste

In addition to the above, Kitakyushu has carried out activities under a JICA Partnership Program (2000-2001) and a Japan Bank for International Cooperation (JBIC) waste management project and survey (2002-2003), in addition to feasibility studies on the construction of incineration power

7 Masaaki Osawa. Recycling industry in action in Asia: Case of Nishihara Corporation in Surabaya, Indonesia. Living Environment Net C&C

8 Nishihara Corporation (2016). Final report on the conclusion of an expansion and demonstration project on recycling-based intermediate treatment and composting of waste in the City of Surabaya, Indonesia. Japan International Cooperation Agency (JICA)

generation facilities using the Joint Crediting Mechanism (JCM) of the Ministry of the Environment since 2013. In addition, Kitakyushu has provided support for basic studies and the formulation of a plan for waste for Surabaya from 2015 to 2017, as a member city of the Climate and Clean Air Coalition to Reduce Short-Lived Climate Pollutants (CCAC) under the United Nations Environment Programme (UNEP) since 2016.

3.3. Water resources sector

3.3.1. Sewage treatment

In Surabaya, contamination of rivers and groundwater is an issue, as even though domestic and industrial wastewater are rapidly increasing in volume, sewage works are not in place and the wastewater generated is not sufficiently treated or is discharged into rivers and underground waterways untreated.

To address this issue, Kitakyushu first worked on developing human resources who could be responsible for water quality monitoring and data analysis from 2007 to 2009, with the aim of managing and improving the water quality of the Kalimas river through the JICA Partnership Program.⁹

Next, from 2012 to 2014, Kitakyushu made use of the JICA Partnership Program to carry out studies and demonstrations in three model areas in the city on the development of decentralised wastewater treatment facilities using small-scale *jokaso* (septic tanks). Using the results from this study and demonstration, Surabaya has been promoting the development of a decentralised wastewater treatment facility using small-scale *jokaso* (IPAL system) using its own municipal budget.

Kitakyushu also provided assistance for the formulation of a sewage improvement plan in Surabaya through a project sponsored by the Ministry of Land, Infrastructure and Transport on formulating a plan for the improvement of sewage works in Surabaya in fiscal 2012, in collaboration with the Kitakyushu Overseas Water Business Association (organisation established by Kitakyushu formed through public-private partnership aiming at the development of overseas water business).

This sector is not particularly connected to the business development of local companies in Kitakyushu. However, the use of technical cooperation as a springboard will lead to improvements in sewerage measures in Surabaya and contribute to the purification of rivers and groundwater and improving the sanitary environment.

3.3.2. Drinking water supply

The population connected to water supply in Surabaya is over 90%, but improvements to infrastructure have not been able to keep up with the ever-growing population. There are various problems found in the supply of safe drinking water, such as aging pipelines, water quality that is unsuitable for drinking, and that the purchase of

packaged drinking water ends up as the burden of low-income earners.

Against this backdrop, a basic survey was conducted in Surabaya using the inter-regional exchange support project of the Japan External Trade Organization (JETRO) from 2011, with mediation from the Asian Center for Low Carbon Society, as Isikawa Engineering Co., Ltd., a local company in Kitakyushu that is engaged in the design, manufacturing and installation of water purification equipment for drinking water, was investigating possibilities for overseas development. Following the basic survey, a study was carried out from 2014 to 2016 on the supply of safe drinking water and improvements to water quality in Surabaya with support from the JICA Partnership Program. In addition to the conduct of a basic survey on water quality improvement under this project, an evaluation was conducted on the profitability of a business model where water purification test equipment would be installed at shops of the local cooperative association and drinking water would be sold in gallon bottles, as well as training for human resources.¹⁰ (Fig. 3.3.5)



Figure 3.3.5. Small water purification system (top) and gallon water at a Surabaya co-op shop (bottom)

Source: City of Kitakyushu, "Initiatives with Surabaya, Indonesia"

A certain level of results were achieved under the JICA Partnership Program, but problems were found in securing factory land and sales networks for actual business development.

On the other hand, measures are in place in Surabaya to supply potable water to residents (Surabaya ZAMP Plan). Based on a request from the city's water supply company (PDAM), a study was carried out using JICA's Project Formulation Survey scheme from 2016 to 2017 on a plan to manufacture and sell an advanced water purification system to produce potable water adjusted according to the quality of raw water.

⁹ JICA Knowledge Site (Improvement of management capacity for water quality in Surabaya)

¹⁰ JICA Knowledge Site (Study on the provision of a safe supply of drinking water and improvements to water quality for Surabaya's residents)

3.4. Energy sector

3.4.1. Smart communities

As the second largest populated city in Indonesia, energy demand is increasing, and it is urgent to make efficient use of energy and subsequent low carbon development. From 2011 to 2013, Nippon Steel Sumikin Engineering Co., Ltd., a local company in Kitakyushu, made use of a commissioned project from the Ministry of Economy, Trade and Industry for a study on promoting the export of infrastructure and systems to evaluate the feasibility of introducing cogeneration and energy management systems to Surabaya Industrial Estate Rungkut (SIER) based on the model of the Kitakyushu Higashida smart community and examined basic strategies towards the low-carbon development of the city as a whole.

3.4.2. Joint Crediting Mechanism (JCM)

The Japanese and Indonesian governments reached an agreement on the Joint Crediting Mechanism (JCM) in August 2013. The JCM is a bilateral system that quantitatively assesses the reduction and absorption of greenhouse gas (GHG) emissions achieved through the JCM and issues credits to be used to achieve Japan's reduction targets, in place of supporting the expansion and implementation of exceptional low-carbon technologies, products and services from Japan and other countries.

Since 2013, when Japan and Indonesia reached agreement on the JCM in cooperation with Kitakyushu-based local companies that have excellent low-carbon technologies, they have participated in the JCM project formulation study based on intercity cooperation, as Kitakyushu has an extensive track record in cooperation in a wide range of areas in Surabaya. In fiscal 2013 and 2014, a study on the possibility of the formation of concrete projects for each of the energy consumption fields (energy, transportation, waste, water resources) was carried out. At that time, Nishihara Corporation took part in a survey on composting projects for waste and Amita Corporation investigated the formulation of projects for the development of raw fuel for cement. In fiscal 2015, a study was carried out that narrowed down and delved into the energy and waste sectors that have high potential of becoming JCM projects from among those projects studied. As a result, in fiscal 2015, a JCM Model Project was adopted with the introduction of a high-efficiency air conditioning equipment in a local shopping mall. From fiscal 2016, continued application has been suspended due to a reduction in the budget scale per JCM project formulation survey and the increased need for JCM in other cities cooperating with Kitakyushu. The JCM project development study conducted in Surabaya for three years resulted in the adoption of only one model project. But as a result, while there is no precedent as a new project scheme, Kitakyushu and Surabaya have taken on the challenge to create a system that will contribute to the

horizontal development of the formulation of projects and taken a leading role in the JCM project, including the implementation of project development studies in a wide range of fields and taking the lead over other cities in providing assistance in developing packages, as well as supporting the establishment of a system to construct green buildings in Surabaya in connection with the introduction of energy-saving equipment in buildings.

3.5. Public sanitation sector

In Southeast Asia, which includes Indonesia, the dengue virus infection from mosquitos (dengue fever) has expanded in urban areas and become a social issue.

Kyushu Medical Co., Ltd., a local company in Kitakyushu, has experience working on selling shrimp aquaculture feed in Indonesia as part of its biotechnology business and was considering developing a secondary business in Indonesia. A project development study was implemented from 2015 using one of Kitakyushu's subsidy projects (support to SMEs for the development of environmental business in Asia), after MOSNON, an environmentally-friendly mosquito larval insecticide, which had already been commercialised, was put on exhibit at the Kitakyushu booth during an exhibition held in Jakarta in 2013. Since then, verification demonstrations have been carried out at five places in Surabaya using the Surabaya city's budget (with the company paying for the pesticide and travel) in cooperation with Surabaya's Health Department in 2017, as permission had been obtained from the government of Indonesia for the product to be used as an insecticide. (Fig. 3.3.6)



Figure 3.3.6. Demonstration of MOSNON

Validation carried out by injecting chemicals into a reservoir or other body of water where residents bathe.

Source: City of Kitakyushu, "Initiatives with Surabaya, Indonesia"

3.6. Other (private sector exchange, etc.)

Kitakyushu is starting to explore the possibilities not only for collaboration focusing on past business development, but also the long years of cooperation between residents based on its history of sister city collaboration with Surabaya. At the time of this writing (March 2018), although the relationship has not yet led to the development of concrete business, one of the areas under consideration is the promotion of eco-tourism linked with conservation activities in mangrove forests that is being undertaken by a local NGO. The mangrove forest spreads along the eastern coast of Surabaya and the possibility of an integrated watershed management model is being explored linked to waste management and sewage treatment, areas that have been addressed by both cities in the past, in addition

to the environmental education of residents through the conservation and ecological restoration of the mangroves. In this twentieth year of collaboration, new styles of intercity cooperation are being revealed, not only in business, but also through cooperation with residents.

4 Results of cooperation

4.1. Results of business development

The fact that the cities of Kitakyushu and Surabaya have continued to develop intercity collaboration activities for 20 years at the cutting-edge of international cooperation seems to be unprecedented in local governments in Japan and Indonesia, and can be considered as reference for cities both in Japan and overseas when considering intercity collaboration.

From the perspective of local business development (package export) of local companies in Kitakyushu, which is one of the objectives of environmental sister city relationship, many projects have reached the demonstration stage, created jobs locally, and contributed to the local economy. However, there have been no cases in the 20 years of cooperation that have led to commercialisation as an independently developed business (at the time of this writing in March 2018). This can be seen as a reflection of the difficulty in the overseas business development of SMEs.

4.2. Results of cooperation

As shown in the various examples above, from the perspective of international cooperation or intercity collaboration, various technical cooperation activities have borne fruit in waste management and improvements in water and sewage works. There are several activities that have been established as measures in Surabaya have continued to develop even after the completion of each project. It is thought that there have been particularly significant effects from the reduction, recycling, greening and beautification activities of Surabaya that have been triggered by the introduction of the Takakura Method of composting, with Surabaya receiving the Adipura Award¹¹ given to cities in Indonesia that contributed the most to the development of an environmentally-conscious city.

After receiving the award for the first time in 1982, Surabaya has won this award each year from 1993 to 1997. However, since then, Surabaya let the opportunity slip away as the environment continued to deteriorate. Surabaya received the award again in 2006 as waste management and city beautification improved through cooperation with Kitakyushu, and since then, the city won the award each year until 2017. From 2011, Surabaya has received the Adipura Kencana Award each year, a special prize with the highest authority even among the Adipura

Awards, and in 2016, the city receive the most prestigious award, the Adipura Paripurna (Fig. 3.3.7). Surabaya has also won numerous awards both in Indonesia and abroad that have been awarded to local governments carrying out exceptional environmental measures, such as the ASEAN Environmentally Sustainable City Award (2011-2012), and has steadily established itself as a brand as it has changed its designation as an environmentally advanced city (Green City) in Southeast Asia.



Figure 3.3.7. Surabaya's history of winning the Adipura Award and relationship with Kitakyushu

4.3. Ripple effect

A waste management model centred on the composting of organic waste in Surabaya that was established with the start of cooperation with Kitakyushu was subsequently introduced to other cities in Indonesia with support from intercity collaboration with Kitakyushu, the JICA Indonesia Office, and the Indonesian government. This model has also been expanded to cities in other countries as part of the "Kitakyushu Initiative for a Clean Environment" and contributes to the improvement of the environment in those cities.¹² Through this, it is significant that Surabaya's role has turned into that of mentor to convey its experience to other cities, moving away from its traditional position as recipient of cooperation.

In addition, the potential effects that environmental cooperation with Kitakyushu has brought to Surabaya, including results that cannot be expressed numerically, such as changes in environmental awareness and

11 Adipura Award: An award system implemented by the Indonesian government since 1986 (under the jurisdiction of the Environmental Forestry Award) given to cities that have made the most contributions to creating an environmentally-friendly city. There are four categories by population with winning cities selected in each category according to predetermined evaluation criteria and review procedures.

12 Toshizo Maeda (2010). *ibid.*

customs of the residents of Surabaya, are considered to be significant. However, after 20 years, it is hard to justify how intercity cooperation with Surabaya has benefited Kitakyushu and its residents. The fact that Kitakyushu contributed to the transition of Surabaya to a green city has been featured in many papers and literature and is becoming a well-known fact both in Japan and abroad. Therefore, the establishment of the brand of Surabaya as a green city is believed to have contributed to strengthening the environmental brand power of Kitakyushu, which has cooperated with Surabaya for many years, and raising awareness, which can be said to be a benefit. The return to residents is difficult to see specifically, but Kitakyushu, which had not traditionally focused on household composting, has "reimported" the Takakura Method for composting and expanded this model to residents through "organic waste recycling courses" organized by the city, which can also be said to be an expression of return to the residents.

In the future, it is hoped that there will be some concrete results that will come out in business development, which is one of the four objectives of the Green Sister Cities. However, based on the track record of government-led collaboration to date, it is expected that awareness in both cities will improve further and develop into a more mature style of intercity cooperation with the participation of voluntary efforts by residents and private businesses, packaged tourism and business development.



Collaboration with Hai Phong, Socialist Republic of Viet Nam

Located about 100 km east of Hanoi, the capital city of the Socialist Republic of Viet Nam (hereinafter referred to as “Viet Nam”), and about 200 km from the Chinese border, Hai Phong is integral as a logistics base.

Facing the Red River (Song Koi River) Delta and the Gulf of Tonkin, Hai Phong has developed as the largest port city in northern Viet Nam with a thriving trade and shipping industry. The container handling volume of Hai Phong Port, which has four terminals, accounts for about 15% of Viet Nam as a whole and about 50% of the volume in the northern part of the country.

The population of Viet Nam is about 92.7 million. The gross domestic product (GDP) per capita is USD 2,215 and the economic growth rate is 6.21%.¹ The current population of Hai Phong, which is about 1.96 million and is expected to reach three million by 2025, makes it the third largest city in Viet Nam after the cities of Ho

Chi Minh and Hanoi. It is also one of two municipalities (centrally-controlled cities)² in Viet Nam.



1 Policy background

Viet Nam formulated the “National Strategy on Climate Change” in 2011 and set goals and priority projects up to 2015, as well as a long-term vision to 2050. The Ministry of Natural Resources and Environment (MONRE) has been appointed as the competent ministry for this strategy, and in 2012, the “National Committee on Climate Change” was established under the Prime Minister. Viet Nam’s greenhouse gas (GHG) emissions in 2010, which were about 250 million tonnes (CO₂e), are expected to increase to 790 million tonnes by 2030. Viet Nam is submitting a national target to the United Nations Framework Convention on Climate Change for a reduction in GHG emissions by 8% compared to business-as-usual (BAU) and by 25% if international aid is available.³

As the National Strategy on Climate Change is a means to achieve green growth around the country, Viet Nam formulated the “National Green Growth Strategy” in 2012, with the Ministry of Planning and Investment (MPI) tapped as the competent ministry to lead this initiative. The nation’s “Green Growth Action Plan” was formulated

in March 2014, followed by the “Green Growth Action Plan of the City of Hai Phong” in July of the same year. As the largest port city in northern Viet Nam, Hai Phong is aiming to become a “Green Port City” to realise sustainable and environmentally-friendly economic development.

2 Catalyst for cooperation

Cooperation between the cities of Kitakyushu and Hai Phong began with a visit by Mayor Kenji Kitahashi to Hai Phong in April 2009 to enter into a “friendship exchange agreement”. Hai Phong and Kitakyushu have developed as international trade ports and industrial cities, and in recent years, they are both aiming to become environmentally-friendly port cities. It can be said that the needs of Kitakyushu, which has overcome pollution and is developing and shifting environmental technologies and urban planning know-how into international cooperation and business, and Hai Phong, which is aiming to become an environmental city, are in agreement. The “friendship exchange agreement” contains wording on accepting Hai Phong municipal staff as trainees, disseminating

¹ Ministry of Foreign Affairs (2017) Socialist Republic of Viet Nam, Retrieved October 19, 2017, from <http://www.mofa.go.jp/mofaj/area/vietnam/>

² There are five municipalities in Viet Nam: Ho Chi Minh, Hanoi, Hai Phong, Da Nang, and Cần Thơ.

³ Government of Vietnam (2016), Intended Nationally Determined Contribution of Viet Nam

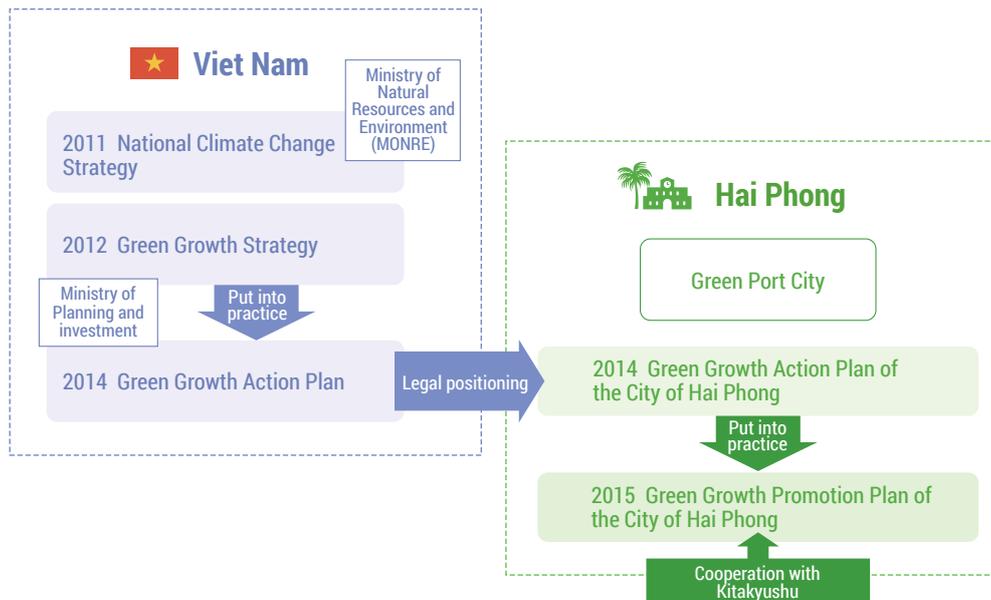


Figure 3.4.1. Environmental policies in Viet Nam and Hai Phong

information on business in Viet Nam with a focus on Hai Phong, dispatching economic mission teams, and implementing international cooperation on the environment, water and sewage works. Following the conclusion of the friendship exchange agreement, mutual visits by the mayors of both cities and exchange in the economic and water supply sectors started full-scale.

3 Enhancing cooperation

3.1. Cooperation framework

As described above, Kitakyushu and Hai Phong signed a friendship exchange agreement in 2009 and entered into a sister city agreement in 2014. In addition, various memorandums of agreement have been signed in the water and sewage works sector, as well as the economic cooperation field, with concrete cooperation projects being implemented accordingly.



Figure 3.4.2. Signing ceremony for the sister city cooperation agreement

Source: Website of the City of Kitakyushu, Exchange with the City of Hai Phong, Viet Nam

3.2. Development of cooperation

Since the conclusion of the friendship exchange agreement, the mayors and deputy mayors of both cities (for Hai Phong, this is the Chair and Vice-Chair of the People's Committee) have visited each city every year to enhance cooperation. In particular, in 2010, a delegation represented by Mayor Kitahashi and then-Chair of the Kitakyushu City Assembly, Mr. Sasaki, visited Hai Phong and took part in the 55th anniversary ceremony of Hai Phong's liberation from the French. In 2014, the Chair (Mayor) of the Hai Phong People's Committee, Mr. Duong Anh Dien, visited Kitakyushu.

The following year in 2010, when the friendship exchange agreement was concluded in the economic sector, economic exchange seminars were held in both cities. In July of the same year, former Deputy Mayor Hashimoto led an economic mission group to Hai Phong, and in August of that same year, Mr. Nguyễn Văn Tùng, Chair of the Hai Phong People's Committee, visited Kitakyushu where he took part in the economic exchange seminar.

A "Memorandum of Understanding on Technical Exchange in the Waterworks Sector" was concluded in 2009, followed by a "Memorandum of Understanding on Technical Exchange in the Sewage Works Sector" in 2010. In addition, in 2011, the cities entered into a "comprehensive agreement" on the conduct of technical consultations on issues concerning water and sewage works that Hai Phong was facing, as well as a "practical agreement" with Haiphong Water Supply One Member Co., Ltd. In 2014, when the end of the term for the "Memorandum of Understanding on Technical Exchange in the Sewage Works Sector" was approaching, Kitakyushu and Hai Phong renewed the MoU for an indefinite period.

In the environment and low-carbon sector, Kitakyushu assisted in the preparation of the “Green Growth Promotion Plan of the City of Hai Phong” with a request from Hai Phong, an implementation plan for the concrete development of the city’s policies for the “Green Growth Strategy”. The Green Growth Promotion Plan clearly states the city’s vision, basic policies, and specific measures towards Hai Phong’s aim of developing a Green Port City, in which 15 measures in seven sectors are positioned as pilot projects that aim to be achieved in the short term. In May 2015, Mayor Kitahashi visited Hai Phong to deliver a final report on the completion of the “Green Growth Promotion Plan of the City of Hai Phong” to the Chair of the Hai Phong People’s Committee.



Figure 3.4.3. Final report on the “Green Growth Promotion Plan of the City of Hai Phong”

Source: Website of the City of Kitakyushu, Exchange with the City of Hai Phong, Viet Nam

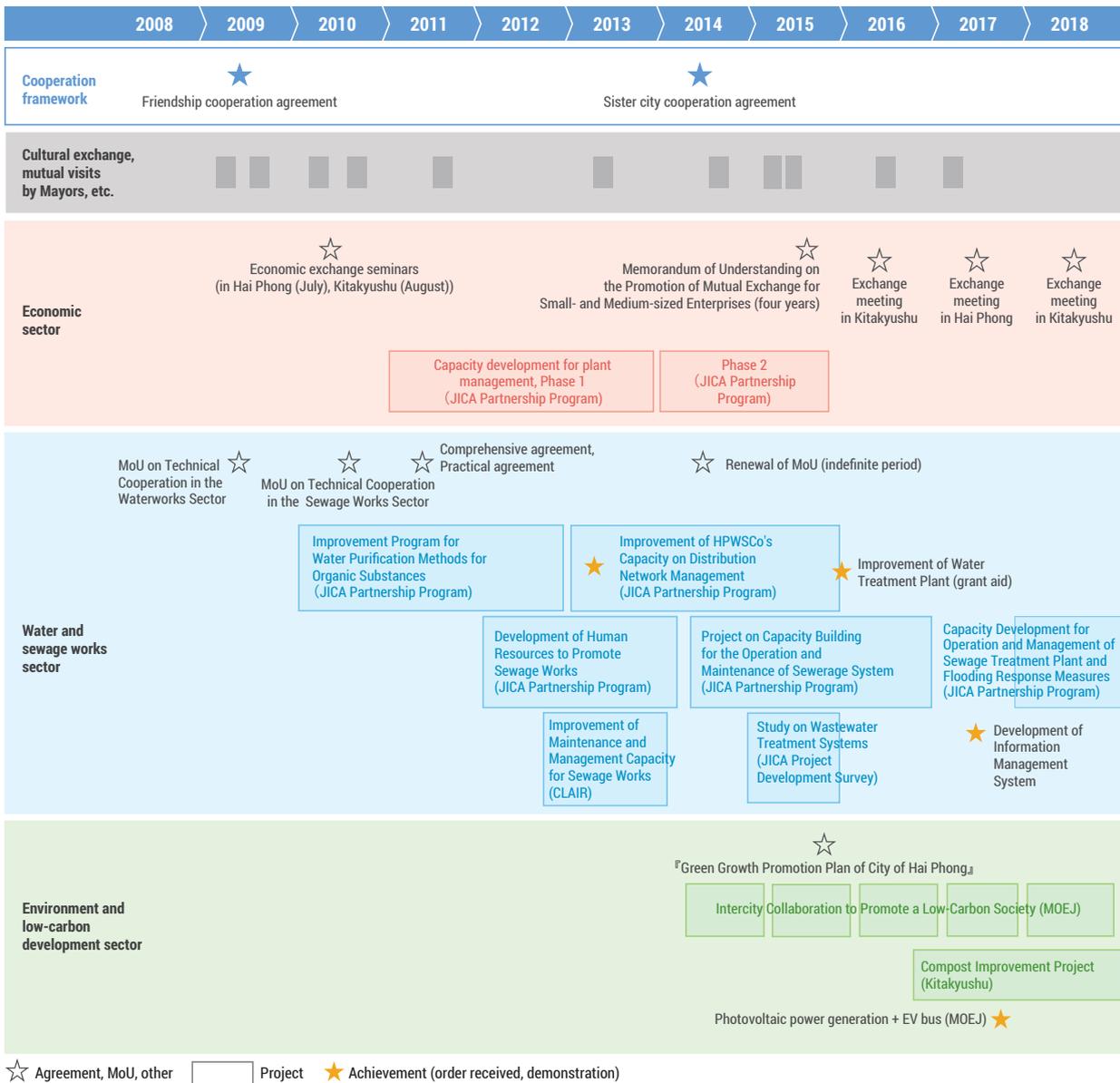


Figure 3.4.4. Expansion and transitions in cooperation areas between the cities of Kitakyushu and Hai Phong

4 Development of cooperation areas

This section specifically describes how collaborative projects in both cities developed in each of the sectors shown in Fig. 3.4.4.

4.1. Economic sector

Cooperation in the economic sector in both cities is mainly carried out by the Kitakyushu International Techno-cooperative Association (KITA), with the implementation of technical cooperation, such as studies to identify new pollution control projects (JBIC) and consulting on environmental improvement (Japan Fund for Global Environment).

International intercity collaboration was promoted between industry, academia and government to encourage the development of small- and medium-sized manufacturing industries in Hai Phong based on the “friendship exchange agreement” concluded in April 2009 (Fig. 3.4.5). Specifically, the “Capacity Development Program for Plant Management in Manufacturing Industries in the City of Hai Phong, Viet Nam” (JICA Partnership Program (Regional Economy Revitalization Special Frame)) was implemented from FY 2011 to 2013, under which the following activities were carried out: (1) improvement of skills of instructors at Hai Phong Industrial Polytechnic College and support in creating curriculums, and (2) improvement of plant engineering and training of production management personnel in local companies with instruction for improvements on-site through the 5S (“Sort”, “Set In order”, “Shine”, “Standardize” and “Sustain”).

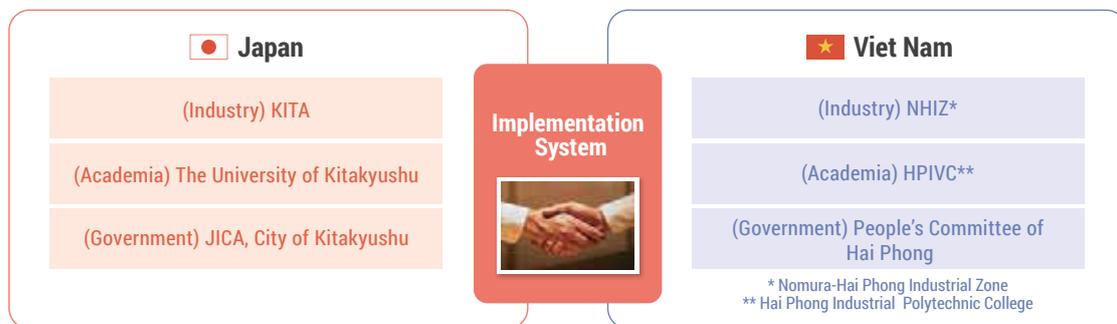


Figure 3.4.5. Diagram of collaboration between industry, academia and government

Source: KITA presentation materials, created by the authors based on JICA Partnership Program: Knowledge transfer program to improve the technical and management capacity of manufacturing industries in Hai Phong

Since the initiatives under the “Capacity Development Program for Plant Management in Manufacturing Industries in the City of Hai Phong, Viet Nam” were so well-received, a second phase, “Knowledge Transfer Program to Improve the Technical and Management Capabilities of Manufacturing Industries in Hai Phong” (September 2013 to March 2016, JICA Partnership Program (Regional Economy Revitalization Special Frame)), was implemented in order to improve and establish the technical and management capabilities of local manufacturing industries. In the second phase of this programme, the following activities were carried out: (1) individual guidance by experts from Japan to local companies with strong motivation to grow, (2) research on marketing and management in Kitakyushu for staff from Hai Phong Industrial Polytechnic College, executives from local leading companies and Hai Phong City, and (3) business negotiations between companies in both cities through technical exchange between local businesses in Kitakyushu and Hai Phong that improved their technical and management capabilities through this programme.

Based on the results of improving technical and

management capabilities of local companies cultivated through these two JICA Partnership Programs, exhibitions and business negotiations were held between local companies in Hai Phong and businesses in Kitakyushu in 2014 and 2015. In November 2015, the Kitakyushu Industry and Economics Bureau and the Hai Phong Dept. of Commerce and Industry concluded a “Memorandum of Understanding on Promoting Mutual Exchange between SMEs”. Mutual visits have been conducted for several years since 2016 through the “Exchange of SME Operators in Kitakyushu and Hai Phong” as mutual exchange between companies in both cities (company inspections and business exchange meetings, etc.) in order to strengthen and expand business exchange between both cities. These interactions between businesses have borne results, such as actual transactions and trade between companies.

4.2. Water and sewage works sector

4.2.1. Waterworks sector

Cooperation projects were launched after the conclusion of a “Memorandum of Understanding on Technical Cooperation in the Waterworks Sector” between

Kitakyushu and Haiphong Water Supply One Member Co., Ltd. in 2009. In response to the clarification of Haiphong Water Supply One Member's intentions to develop Kitakyushu's water distribution block system in 2011, a system that can effectively distribute water and prevent leakages by dividing up the water supply area, the cities signed a "comprehensive agreement" for technical consultations based on requests from Hai Phong on issues in water and sewage works, and a "practical agreement" to request technical consultations from the Kitakyushu Water and Sewer Bureau in the event that a technical problem occurred when Haiphong Water Supply One Member was developing the water block distribution system.⁴

Specific cooperation in the waterworks sector was developed according to the flow shown in Fig. 3.4.6. Based on the "Memorandum of Understanding on Technical Cooperation in the Waterworks Sector" that was concluded in 2009, technical cooperation started with the aim of transferring purification treatment technology in Kitakyushu, and from 2010 to 2012, the "Improvement Program for Water Purification Methods for Organic Substances (JICA Partnership Program (Regional Economy Revitalization Special Frame))" was implemented, followed by the conduct of the "Improvement of HPWSCO's Capacity on Distribution Network Management (JICA Partnership Program (Regional Economy Revitalization Special Frame))" between 2013 and 2016.

Under the abovementioned "Improvement Program for

Water Purification Methods for Organic Substances", a demonstration project on an advanced water purification treatment technology (BCF, bio-contact filtration) using organic matter patented in Japan by the Kitakyushu Water and Sewer Bureau, was carried out at the An Duong water treatment plant, which demonstrated its effectiveness. As a result, Hai Phong decided to introduce BCF to the small-scale Vinh Bao water treatment plant using its own funds. Construction started in May 2013 and was completed in December of the same year. Following that, Hai Phong decided to introduce U-BCF (Upward Flow Bio Contact Filtration) technology⁵ to the large-scale An Duong water treatment plant with funds procured through grant aid from the Japanese government. A joint venture, which includes Kitakyushu Water Service Co., Ltd., an organisation affiliated with the City of Kitakyushu, won the contract for this project.⁶ In addition, this U-BCF technology has been adopted under a JICA expansion and demonstration project to support the overseas development of SMEs, "Expansion and Demonstration for Water Treatment Using Upward Flow Bio Contact Filtration (U-BCF) in Viet Nam". The U-BCF demonstration at water purification plants in six cities in Viet Nam, including Hai Phong (Ho Chi Minh City, Quang Ninh Province, Phu Tho Province, Nam Định Province, Tiền Giang Province), was implemented by Team Kitakyushu (collaboration between Uni-Elex Co., Ltd., Kitakyushu Water and Sewer Bureau, Matsuo Sekkei Co., Ltd. and Kitakyushu Water Supply

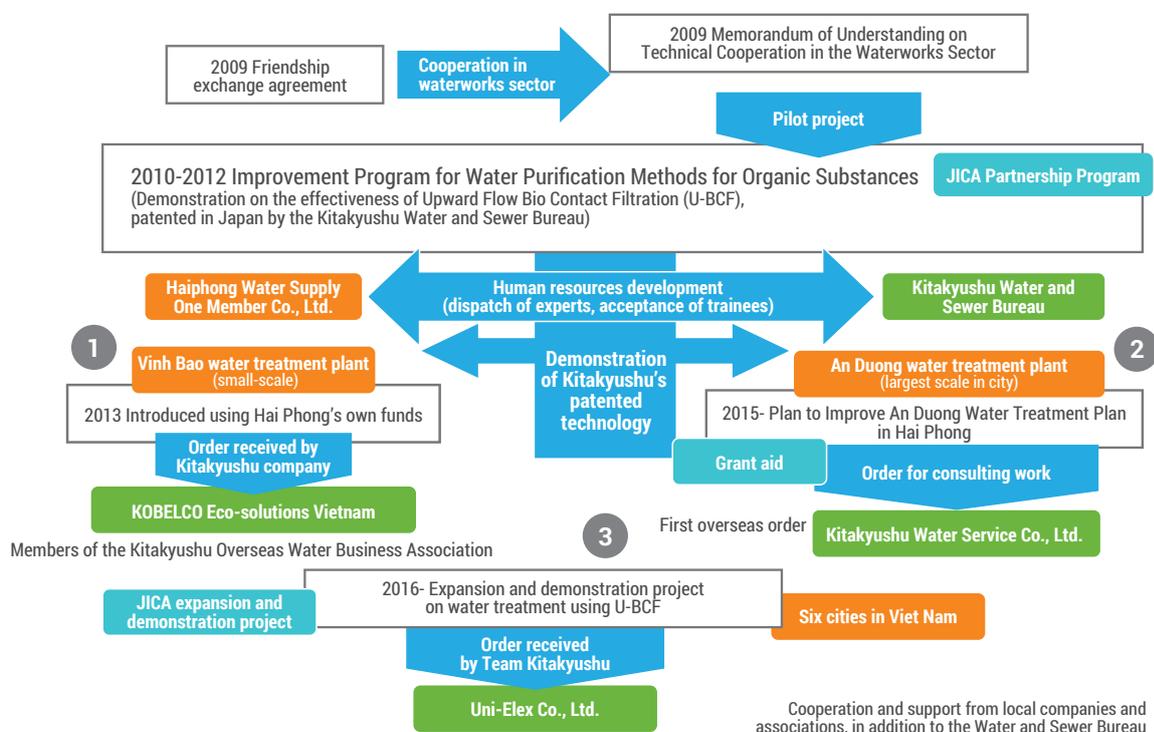


Figure 3.4.6. Cooperation between Hai Phong and Kitakyushu and development of projects in the waterworks sector

4 Kitakyushu Water and Sewer Bureau (2011), Development of new water business in Hai Phong, Viet Nam: Conclusion of agreement on improvement of water and sewage works, (press release materials)

5 One-half the construction cost and 1/20th the running cost compared with general advanced treatment (ozone activated carbon).

6 Kitakyushu Water and Sewer Bureau (2016), Expansion and development of U-BCF in Viet Nam (press release materials)

Association that are local companies or organisations in Kitakyushu).⁷

4.2.2. Sewage works sector

In the sewage works sector, Kitakyushu concluded a memorandum of understanding with the Haiphong Sewerage and Drainage Co., Ltd. (SADCO) in November 2010, when the capacity building and technical cooperation in the sewage works sector began. As shown in Fig. 3.4.7, the capacity building programme has continued through the acceptance of trainees and local technical guidance, as well as the development of guidelines for the maintenance and management of pumping stations and guidelines on the maintenance and management of pipeline facilities through the JICA Partnership Program and the CLAIR Local Authorities International Cooperation Promotion Project.

In addition, as part of an ODA loan project (Hai Phong

Urban Environment Improvement Project II) aimed at improving sewage, wastewater and waste treatment systems in Hai Phong, a project to improve information management systems for sewage works was implemented. A local company, Geocraft Co., Ltd., won the contract for this project. A joint venture (JV) of the Water and Sewer Bureau implemented the project.⁸ In 2015, the company also won a contract to develop an integrated management system (mapping system) to manage waterworks facilities in Hai Phong, and the company decided to develop the mapping system for water and sewage works in Hai Phong together.⁹ In addition, the company that won the contract for this project is a local company in Kitakyushu that is located in the rental office at the “Kitakyushu Overseas Business Support Center” established in the office building of Haiphong Water Supply One Member company in April 2016, where activities making use of this base are leading to incoming orders.

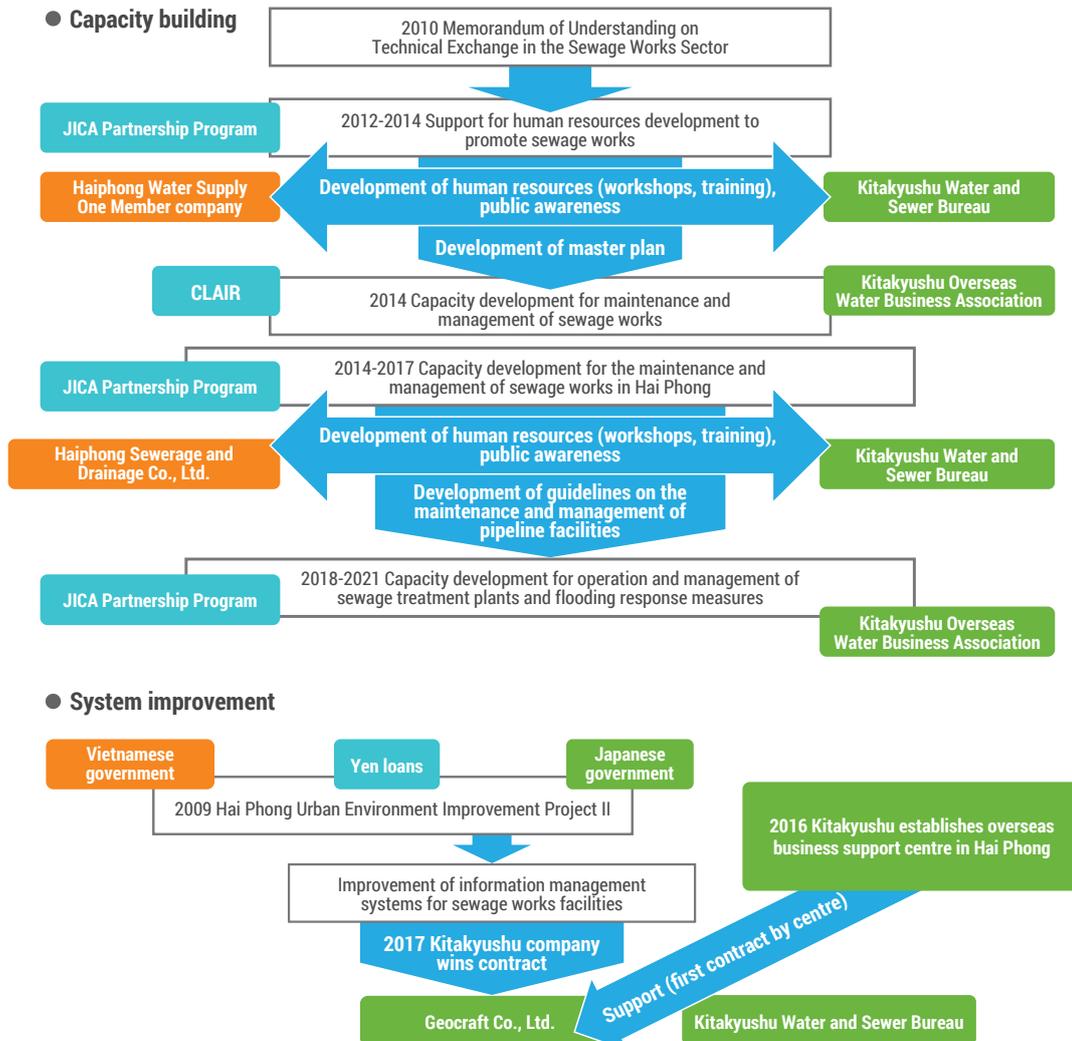


Figure 3.4.7. Development of cooperation between Hai Phong and Kitakyushu in sewage works

7 Kitakyushu Water and Sewer Bureau (2016), Start of demonstration project on U-BCF in six cities in Viet Nam: Transfer of U-BCF technology by Team Kitakyushu from Hai Phong to other areas of Viet Nam (press release materials)
 8 Kitakyushu Water and Sewer Bureau (2017), Local company wins contract for "Improvement of information management systems for sewage works facilities" in Hai Phong, Viet Nam: First water business project after the establishment of the Kitakyushu Overseas Water Business Support Center" (PR materials)
 9 Kitakyushu Water and Sewer Bureau (2017). Ibid.

4.3. Environment and low-carbon sector

The Hai Phong Green Growth Action Plan was developed in July 2014 by Hai Phong based on the Green Growth Strategy formulated in 2012 and the Green Growth Action Plan formulated in 2014 by the Viet Nam Ministry of Planning and Investment. Section 8 of the action plan states that “plans will be proposed to develop cooperation programs with the Japanese Ministry of the Environment and the City of Kitakyushu in cooperation with the Department of Foreign Affairs and the Department of Planning and Investment and led by the Department of Natural Resources and Environment. Specific projects will be used to give shape to the Green Growth Strategy.”¹⁰

Based on a request from Hai Phong, Kitakyushu provided support to develop the “Green Growth Promotion Plan of the City of Hai Phong” and identify projects with potential to reduce emissions through support from Japan (in particular, energy-related CO₂ emissions), acquire JCM credits through the implementation of such projects, and develop systems to monitor and quantify effects locally, targeting sectors with high GHG emissions, under the Ministry of the Environment’s project on “FY 2014 Feasibility Study on JCM Large-scale Projects to Create Low-Carbon Societies in Asia: Support for the formulation of the Hai Phong Green Growth Plan in Cooperation with the City of Kitakyushu.” (Fig. 3.4.8).

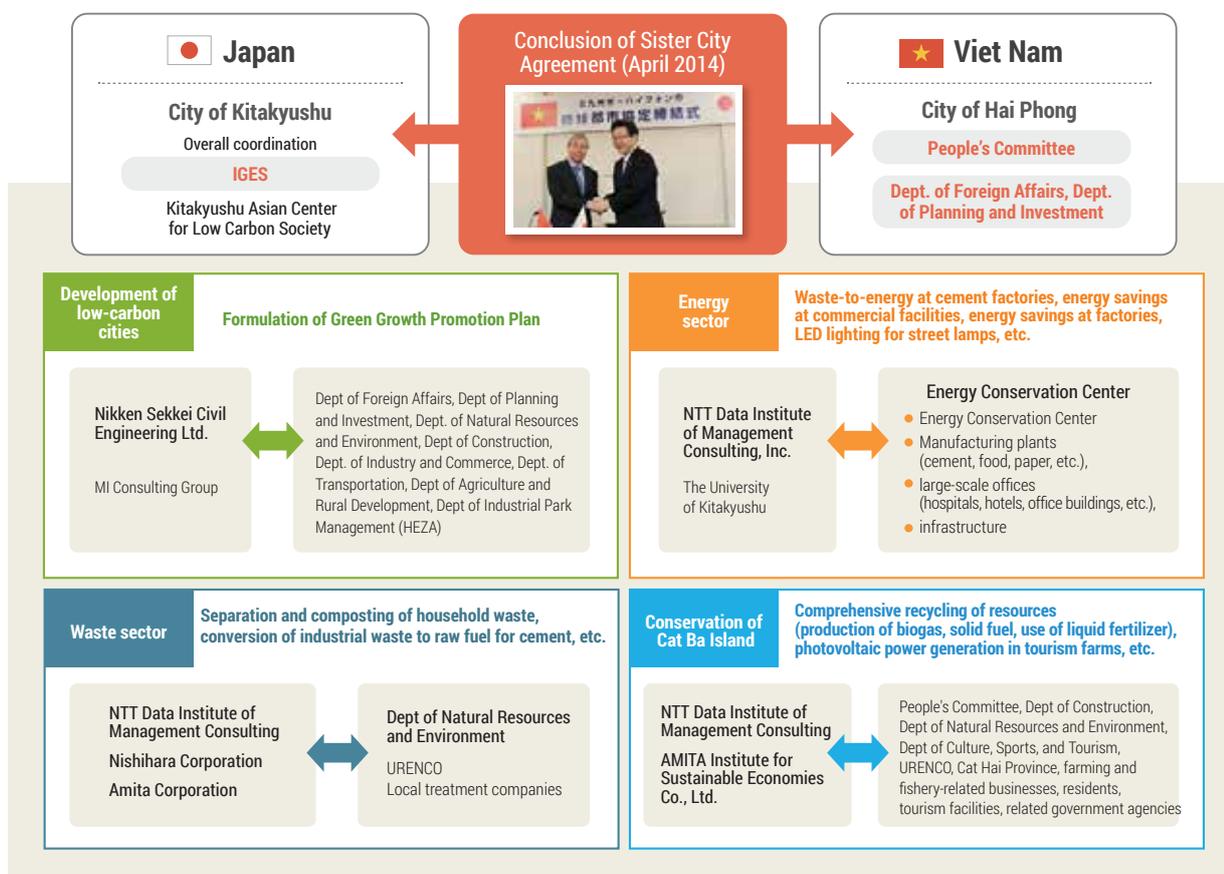


Figure 3.4.8. System to support the formulation of the Hai Phong Green Growth Plan in cooperation with Kitakyushu

Source: IGES, other (2015)¹¹

The “Kitakyushu Model”, which systematically organises Kitakyushu’s project know-how connected with the development of plans and low-carbon development, was used in the formulation of the “Green Growth Promotion Plan of the City of Hai Phong” (GGP). The plan is divided into the seven sectors as shown in Fig. 3.4.9 and Table 3.4.1, with waste, energy, transportation, and Cat Ba Island (World Natural Heritage archipelago in Ha Long Bay) positioned as key sectors with strong connections to GHG emissions, and including other sectors, such as water,

sewage and rainwater drainage, environmental protection, and green production. In addition, concrete tasks in each sector were identified and linked to specific measures to overcome these problems. Of those specific measures, those that could be expected to be implemented quickly and be highly effective were proposed as pilot projects.¹²

With the incorporation of specific measures into the top plans of Hai Phong, priority for the implementation of measures is high. Consultations carried out repeatedly with related departments, companies, residents, and universities

¹⁰ City of Kitakyushu, City of Hai Phong (2015), “Green Growth Promotion Plan of the City of Hai Phong”

¹¹ Institute for Global Environmental Strategies (IGES), City of Kitakyushu, Nikken Sekkei Civil Engineering Ltd., NTT Data Institute of Management Consulting, Inc., Nishihara Corporation, Amita Corporation, Amita Institute for Sustainable Economies Co., Ltd. (2015), “FY2014 Report on the Feasibility Study on the Formulation of a Large-Scale JCM Project for the Development of Low-Carbon Societies in Asia: Support for the formulation of the Green Growth Promotion Plan of the City of Hai Phong in cooperation with the City of Kitakyushu”

¹² City of Kitakyushu, City of Hai Phong (2015), Ibid.

at the planning stages in each sector encouraged the participation of a wide range of stakeholders. As a result, this plan reflects a broad consensus and smooth business development is expected as a result of the involvement of companies with specific technologies at an early stage.

Currently, Kitakyushu is providing support for the implementation of 15 specific pilot projects that have been positioned in the “Green Growth Promotion Plan of the City of Hai Phong”. Progress and results follow below.

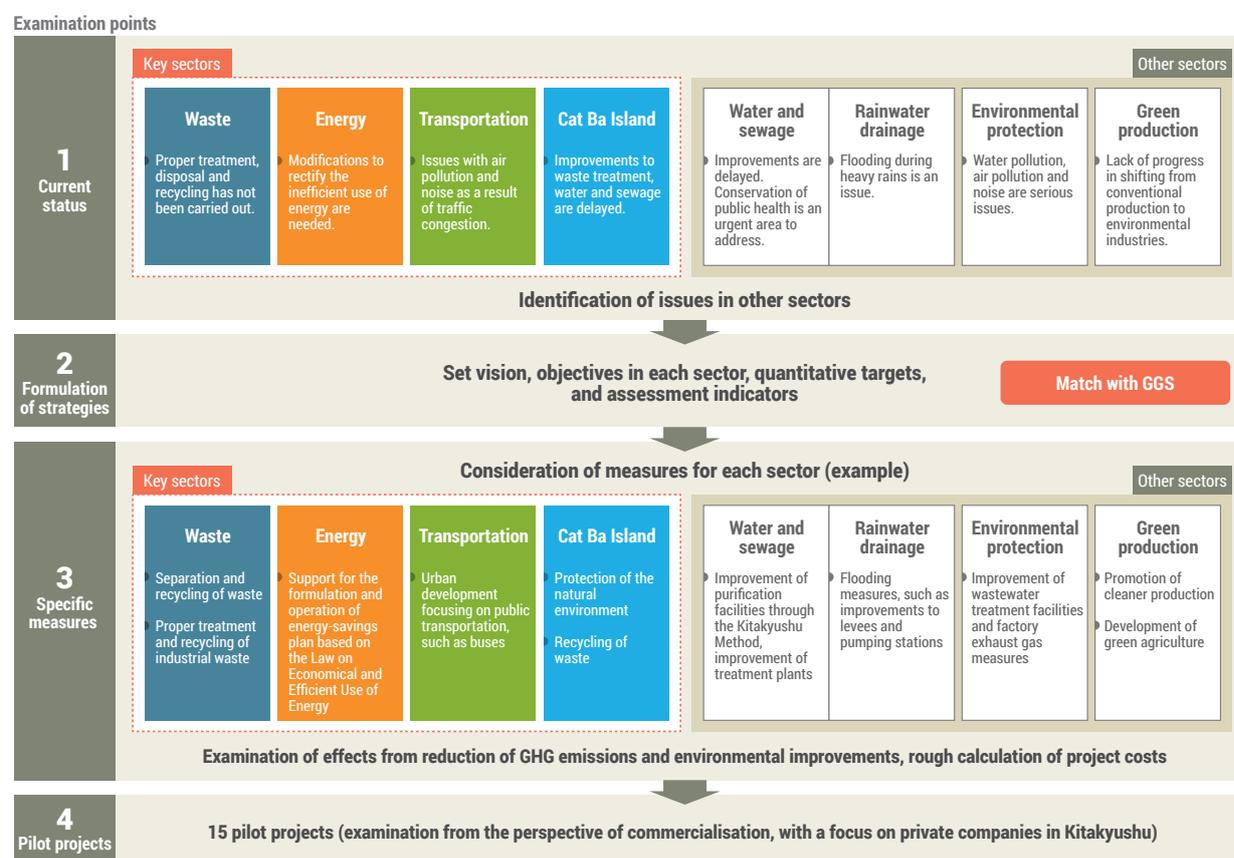


Figure 3.4.9. Target sectors and measures of the “Green Growth Promotion Plan of the City of Hai Phong” (GGS)
Source: Asian Center for Low Carbon Society

Table 3.4.1. Fifteen pilot projects in the “Green Growth Promotion Plan of the City of Hai Phong” (GSS)

Waste	01 Separation and composting of household waste
	02 Waste heat recovery and power generation at cement plant and production of raw fuel for cement
	03 E-waste recycling
Energy	04 Promotion of energy conservation in factories and buildings, other
	05 Introduction of low-emission buses
Transportation	06 Promotion of the use of public transportation
	07 Development of comprehensive resource recycling system
Cat Ba Island	08 Introduction of energy conservation and renewable energy in remote islands and introduction of EV buses
	09 Promotion of U-BCF
Water, sewage and rainwater drainage	10 Wastewater measures for handicraft villages
	11 Introduction of sewage ledger system
	12 Southwest canal regeneration project
Environmental protection	13 Development of air and noise monitoring system
	14 Introduction of high-efficiency electric furnaces in foundries
Green production	15 Promotion of green agriculture

4.3.1. EV bus demonstration project on Cat Ba Island

A demonstration project on the development of a zero-emission type electric (EV) bus using solar power is being implemented on Cat Ba Island in Hai Phong, which has been designated by UNESCO as a “biosphere reserve (UNESCO Park)”, where emphasis has been placed on the co-existence between nature and human society, as an activity aiming at the introduction of environmentally-friendly transportation and renewable energy. In 2015, Soft Energy Controls Inc. adopted a Ministry of the Environment project for the innovation creation of low-carbon technologies for developing countries and carried out the collection, analysis and verification of data on the operation of an EV bus through a three-year test run. With the use of solar power and switching system batteries, the bus is not bound to charging times and can travel for long distances. In the future, Hai Phong aims to introduce an additional 10 buses in 2018 and 30 buses by 2030.



Figure 3.4.10. EV bus demonstration project on Cat Ba Island Source: Asian Center for Low Carbon Society

4.3.2. Composting

Hai Phong which aims to create a clean and green city, has similar problems as other Asian cities in managing organic waste. Kitakyushu has collaborated with Hai Phong Urban Environmental Company (URENCO) to provide comprehensive technology for composting at the Trang Cat waste treatment plant. Kitakyushu dispatches experts to promote technical guidance in order to produce fertiliser that will meet standards for organic fertiliser specified by Viet Nam’s Ministry of Agriculture and Rural Development with the separate collection of organic waste generated at markets, restaurants and hotels in the city and the use of existing composting plants. This has resulted in an increase in the amount of waste processed at composting plants from 20 to 40 tonnes per day. This achievement has been recognised not only by URENCO, but also by the competent Department of Construction and People’s Committee. Hai Phong has a budget to procure materials and bears the costs for inviting experts from Japan. In the

future, Hai Phong plans to increase the amount of waste processed by expanding the targets to septic tank sludge, household organic waste, and pruned branch waste.



Figure 3.4.11. Technical guidance on composting at the Trang Cat waste treatment facility

Source: Provided by Koji Takakura

4.3.3. Wastewater treatment

The “Survey on the Development of a High-Performance Wastewater Treatment System for Wastewater with High Concentrations of Organic Material in Hai Phong (JICA Support Project for Overseas Development of SMEs: Study on project proposal)” aims to help improve water quality in Hai Phong with the application of a wastewater treatment system that uses enzymes generating less surplus sludge compared with conventional treatment methods for industrial wastewater with high concentrations of organic matter that cause water pollution. This project is also positioned as one of the pilot projects in the “Green Growth Promotion Plan of the City of Hai Phong”.

5 Results of cooperation

5.1. Results of business development

As mentioned above, business development has been accomplished in a wide range of cooperation areas and has led to local companies winning contracts for proposals to carry out projects. Intercity collaboration between Kitakyushu and Hai Phong, which began in 2009 under the initiative of the current Mayor of Kitakyushu, has been formalised between the two cities through the friendship exchange agreement (2009) and sister city agreement (2014), with the active implementation of mutual exchange between the mayors, deputy mayors, city council members, and others. Driven by exchange between the top representatives of both cities in the economic sector, economic exchange seminars have been mutually held since early on and both cities have been working to improve and establish the technical capabilities and management skills of local manufacturing industries through the JICA Partnership Program. These results have

led to the organisation of exchange meetings, including technical exhibitions and business meetings held annually since 2015, and has given shape to the formation of actual transactions and trade.

There has been active cooperation in the water and sewage works sector. Since the establishment of the sister city cooperation agreement in 2009, memorandums of agreement on technical exchange in each of the sectors of water and sewage works have been concluded, contributing to developing capacity in both these sectors in Hai Phong through the acceptance of trainees and the dispatch of experts with the use of the JICA Partnership Program. Meanwhile, with the Kitakyushu Water and Sewer Bureau as the main actor, financial tools, such as grant aid, are being used for the introduction of technologies that are inexpensive in terms of construction and operation costs compared to general processing methods, such as U-BCF, and business proposals have been steadily linked to local companies winning contracts because of this. The initiatives of the Kitakyushu Overseas Water Business Association, established in 2010, and the Overseas Business Support Center, established in Hai Phong, can be said to have boosted these results.

In addition, priority policies were selected through discussions with a wide range of stakeholders based on higher plans and policies to provide support for the creation of the “Green Growth Promotion Plan of the City of Hai Phong”, with an aim to develop a master plan on urban development in the environment sector. As a result, the potential to implement projects has increased and a mechanism is being created to promote business development. In particular, activities are currently being carried out by both cities towards the implementation of

all 17 pilot projects, which are positioned in the plan, with some projects already underway, such as the EV bus demonstration project on Cat Ba Island.

5.2. Beneficial effects in the city

Since the conclusion of the friendship exchange agreement between the cities of Kitakyushu and Hai Phong in 2009, exchange has not been limited to the industrial sector; rather a wide range of exchange has been carried out, including the participation of civic cultural groups in events and commemorative ceremonies. A “Training Course to Promote Understanding by Young Human Resources in Water and Sewage Works”, for high school students in the city is being implemented at the Kitakyushu Water and Sewer Bureau and the JICA Kyushu International Center, and overseas training is planned with a one-week visit to Hai Phong in August 2018. In addition, cooperation between the two cities has expanded to the fields of disaster measures and disaster prevention drills, and the Center for the Development of Environmental and Fire Prevention Technologies of the Institute for Environmental Science and Technology at The University of Kitakyushu has developed an information transmission and shared on-the-job training system that visualises disaster prevention training technologies and techniques, called the “Kitakyushu Method”, for governmental organisations in Hai Phong to strengthen its collaborative ability to promote rapid disaster responses. In this way, the relationship between both cities is expanding to include exchange involving residents and universities and is bringing about beneficial effects not only for business development in the environmental sector, but also in the form of public and academic participation.



Collaboration with Mandalay, Republic of the Union of Myanmar

The city of Mandalay is one of the largest cities in Myanmar. According to the Mandalay City Development Committee (MCDC), the city had a population of 1.2 million in 2014 and was divided into six townships and 96 wards for administrative purposes. Mandalay had taken strong initiatives to develop a smart and green city. This was shown by the formulation of its first long-term urban development plan, the Mandalay City Development Concept Plan Vision 2040, by the MCDC and the Department of Human Settlement and Housing Development (DHSHD) in 2013. The plan by MCDC and DHSHD introduced the vision of the city of Mandalay to become a “green cultural city, with clean air, a centre of tourism, a trade and logistics hub, and an IT centre for upper Myanmar”. This vision is being materialised under a major urban investment programme called The Mandalay Urban Services Improvement Project which was funded by the Asian Development Bank (ADB) and the French Agency for Development (AFD).¹ The first two physical values mentioned in Mandalay’s vision above are “green cultural city” and “with clean air”. These two values are related to environmental issues; thus, the city needs to reflect on their current environmental challenges in order to achieve this vision.

However, the existing conditions in Mandalay reflected significant deficiencies in urban infrastructure and services, such as water supply, sanitation, drainage, wastewater, and solid waste management, as a result of underinvestment. Therefore, comprehensive improvements to urban infrastructure, along with simultaneous capacity building of all city stakeholders and adaptive institutional improvements would be key strategies in accelerating the implementation of the city plan above.



1 Policy background

The Republic of the Union of Myanmar has a population of 48.7 million people.² Since March 2011, Myanmar has put emphasis on improving its public services with good governance. One of the major improvements was on its international relationship. Japan was one of the first countries to connect with Myanmar. Represented by the Japan International Cooperation Agency (JICA), Japan finalized an agreement with Myanmar on January 15, 2013 to provide a Japanese ODA loan of up to approximately JPY 198.9 billion.³

Just like many other countries, Myanmar was also facing multiple environmental challenges. Therefore, there was an urgency to utilise the support from the Japanese government, emphasising city-to-city collaboration to find solutions to meet environmental challenges and aim for sustainable development. Today, more than half of the world's population lives in cities, which provide a range of basic services and serve as centres of innovation and culture. They are involved in generating 75% of global economic output.⁴ Thus, the importance of the city's direct role in sustainable development should have emerged as a global movement.⁵

1 Honda, E., Desille, D., & Htay, K. M. (2015). Mandalay Urban Services Improvement Project: Toward a Green Mandalay. Asian Development Bank (ADB). Retrieved from <https://www.adb.org/sites/default/files/publication/174028/toward-green-mandalay.pdf>

2 BBC. (2017). Myanmar country profile - BBC News. Retrieved October 2, 2017, from <http://www.bbc.com/news/world-asia-pacific-12990563>

3 JICA. (2013). Signing of Japanese ODA Loan Agreement with the Government of the Republic of the Union of Myanmar. Retrieved October 4, 2017, from https://www.jica.go.jp/english/news/press/2012/130130_02.html

4 Dekki, C. (2015). A Movement for Sustainable Cities and Regions in the 21st Century. Retrieved October 16, 2017, from <http://www.worldurbancampaign.org/movement-sustainable-cities-and-regions-21st-century>

5 Roberts, B. H. (2016). The New Urban Agenda needs to recognize a future of city-to-city networks and trade | Citiscope. Retrieved October 16, 2017, from <http://citiscope.org/habitatIII/commentary/2016/06/new-urban-agenda-needs-recognize-future-city-city-networks-and-trade>

2 Causes of collaboration

The mutual cooperation between the cities of Mandalay and Kitakyushu started not long after the signing of the agreement between JICA and the Government of Myanmar. In the same year, Mandalay declared its commitment to achieve its vision of green city. As there had been no precedence for this green revolution, Mandalay needed to learn from a counterpart through city-to-city collaboration. Thus, the agreement offered an opportunity for Mandalay to connect with Japanese cities, which had extensive experience facing environmental challenges. By learning from the experiences of Kitakyushu, which has received worldwide recognition for its transformation from a “grey city” into a “green city”, Mandalay could proceed with its own adaptation based on actual situations and conditions.

In November 2012, the Environmental Bureau of Kitakyushu, in collaboration with the Institute for Global Environmental Strategies (IGES), was invited to participate in the 2nd Myanmar Forum on Green Economy / Green

Growth (GEGG) in Nay Pyi Taw. Then in early 2013, the Water and Sewer Bureau of Kitakyushu initiated a visit to three major cities in Myanmar (Nay Pyi Taw, Yangon, and Mandalay), with the purpose of conducting a survey on the current state of water supply facilities. These two initial visits simply served as starting points for city-to-city cooperation. During these visits, the Mayor of Mandalay City also visited the “World Peace Pagoda”, the only authentic Myanmar-style temple in Japan, which is located in Kitakyushu, and facilitated a historical connection between Kitakyushu and Myanmar.⁶ From this point onward, collaboration between Kitakyushu and Mandalay has been developed in many fields.



Figure 3.5.1. World Peace Pagoda in Moji, Kitakyushu, Japan

	2011 (Myanmar Reformation)	2012	2013	2014	2015	2016	2017
Fund and Scheme		Kitakyushu	(a) Kitakyushu (b) JICA Grassroots	(a) JICA Grassroots (b) ESC Model Cities (c) MCDC, Kitakyushu (d) JICA	(a) GEGG (b) MCDC, ME, MST, JAIF, IGES, Kitakyushu (c,d) IGES CCET	(a) MONREC, UNEP-IETC, IGES CCET (b,c) IGES CCET (d) Kitakyushu	(a,b) IGES CCET (c) MOEJ
Key Starting Points/ Events		Environmental Bureau participated in the 2nd GEGG	(a) Survey by Water and Sewer Bureau, Kitakyushu				
Water and Sewerage			(b) Technical Cooperation in Water Sector	(a) Kick-off & Tour in Kitakyushu (b) 2-day Workshop in Mandalay			
Waste Management				(c) Waste Management Collaborative Workshop for Kitakyushu and Mandalay	(a) 4th Myanmar Forum on GEGG	(a) Workshops on Developing Waste Management Strategies	
Environmental Education					(b) Environmental Award Session (c) Online Meeting (d) Ecology Note	(b) 18 Model Schools (c) Training of Teachers	(a) Evaluation Survey (b) Institutionalize EE and 3R
Energy and Low-carbon				(d) Training to Build Capacity for Low Carbon City Planning		(d) Visit by Kitakyushu Asian Center for Low Carbon Society to Mandalay	(c) Feasibility Study (Biomass Power; Energy Saving and Renewable Energy)

(Abbreviation) JICA: Japan International Cooperation Agency; ESC: Environmentally Sustainable Cities; MCDC: Mandalay City Development Committee; GEGG: Myanmar Forum on Green Economy / Green Growth; ME: Ministry of Education; MST: Ministry of Science and Technology; JAIF: Japan ASEAN Integration Fund; IGES CCET: IGES – Centre Collaborating with UNEP on Environmental Technologies
Note: A small letter in brackets indicate the connections between “Fund and Scheme”, “Key Starting Points/ Events” and “Field of Collaboration”.

Figure 3.5.2. Timeline of activities of city-to-city collaboration between Kitakyushu and Mandalay

6 Ishii, H. Grassroots Technical Cooperation in Water Supply in Mandalay City, Myanmar. Kyushu Eco-Communication. September 2014

3 Development of collaborative fields

This section elaborates the details of development of respective collaborative fields shown in Figure 3.5.2.

3.1. Water and sewer services

Mandalay lacked the capacity of water supply and failed to provide safe and clean water to its citizens.⁷ Therefore, in December 2013, Kitakyushu initiated technical cooperation to improve water purification facilities and secure a stable supply of safe water, as well as to provide assistance for the proper operation, maintenance and management of water purification plants and improve water quality analysis technology.⁸ Cooperation was positioned under the project, “Improvement of Operation Management Capacity for the Mandalay City Water Purification Plant”, which utilised the “Grassroots Technical Cooperation Project (Regional Economy Revitalization Special Frame)” under the JICA Partnership Program and consisted of accepting trainees and on-site technical guidance.⁹



Figure 3.5.3. Courtesy call to the Mayor of Kitakyushu by the Mayor of Mandalay (above) and site visit to water supply facilities in Kitakyushu (below)

Source: City of Kitakyushu

In the following year in August 2014, a kick-off seminar was held in Kitakyushu with an invitation extended to the Mayor of Mandalay and MCDC executives. Kitakyushu City’s Water and Sewer Bureau, JICA Kyushu, and member companies of Kitakyushu City’s Water Business Promotion Council attended the seminar as representatives of the City of Kitakyushu. The seminar was attended by more than 80 participants to great success. In addition to the seminars, the program also included visits to the city’s waterworks facilities and visits to the World Peace Pagoda. This event was a very meaningful opportunity to discuss future projects and establish a friendly relationship between Mandalay and Kitakyushu.

Following the seminar, Mandalay and Kitakyushu collaborated to implement the development of safe chlorine injection facilities, appropriate water purification plant operation and human capacity building for water quality analysis technology. Trainees from Mandalay started to be accepted in late September.¹⁰ Furthermore, technical support for the establishment of a water purification plant in Mandalay was being prepared.

3.2. Waste management

3.2.1. Initiation of city-to-city collaboration

Waste management is a major environmental issue in Mandalay. Solid waste generation in Myanmar was 5,616 tonnes/day with a per capita waste generation of 0.44 kg/capita/day. This figure was expected to reach about 21,012 tonnes/day with 0.85 kg/capita/day by 2025.¹¹ In that 2012 report, approximately 55% of the total waste generated was mainly from three major cities, including Yangon in first place, followed by Mandalay (955 tonnes/day) in second.¹² The report acknowledged that most of the waste was organic waste. As a result of this collaboration in the field of waste management, cooperative activities have expanded to an even wider scope.

The IGES Kitakyushu Urban Centre (KUC) played an important role in developing this cooperative relationship at the request of the city. In the meantime, IGES designed the “ASEAN Environmentally Sustainable Cities (ESC) Model/Programme” together with the ASEAN Secretariat. This program was launched in 2011 with core funding from the Japan-ASEAN Integration Fund (JAIF). In August 2014, Mandalay was selected as one of the Year 2 Cities in the ASEAN ESC Model Cities Programme together with Pyin Oo Lwin City and Yangon City of Myanmar.¹³ Then, with the support of the ASEAN ESC Model Cities Programme,

7 Honda, E., Desille, D., & Htay, K. M. (2015). Mandalay Urban Services Improvement Project: Toward a Green Mandalay. Asian Development Bank (ADB). Retrieved from <https://www.adb.org/sites/default/files/publication/174028/toward-green-mandalay.pdf>

8 Kitakyushu Asian Center for Low Carbon Society. (n.d.). Water Supply and Sewerage Improvement Projects in Indonesia, Myanmar and China. Original Engineering Consultants Co., Ltd., Kitakyushu City Water & Sewer Bureau. Kitakyushu. Retrieved from <http://www.asiangreencamp.net/pdf/108.pdf>

9 Japan Water Works Association. (2014). *Water and Sewer Bureau*, City of Kitakyushu. Retrieved from http://www.jwwa.or.jp/english/kaigai_file/h26/h26_E12.pdf

10 JICA. (2014). Grassroots Technical Cooperation in Water Supply in Mandalay City, Myanmar. Retrieved October 3, 2017, from <https://www.jica.go.jp/kyushu/eco/2014/201409.html>

11 Hoornweg, D., & Bhada, P. (2012). *What a Waste. A Global Review of Solid Waste Management (Urban Development Series). Urban development series knowledge papers* (Vol. 281). Washington. <https://doi.org/10.1111/febs.13058>

12 Hengesbaugh, M., Premakumara, D. G. J., & May Tin Hlaing, O. (2016). Quick Study on Waste Management in Myanmar. In *First National/City Workshops for Developing National/City Waste Management Strategies in Myanmar* (pp. 13–17). Hayama: Institute for Global Environmental Strategies. Retrieved from <https://pub.iges.or.jp/pub/quick-study-waste-management-myanmar-current>

13 ASEAN ESC Model Cities. (2014a). Mandalay, Pyin Oo Lwin and Yangon Officially Confirmed as Year 2 Cities. Retrieved October 4, 2017, from <https://aseanmodelcities.org/news/mandalay-pyin-oo-lwin-and-yangon-officially-confirmed-as-year-2-cities/>

IGES KUC invited the staff from Mandalay to Kitakyushu to participate in a JICA study tour, "Training to Build Capacity for Low Carbon City Planning". Two representatives from MCDC and the Mandalay Cleansing Department participated in this study tour. Lectures were offered on city planning and transportation management with site visits focusing on solid waste management, such as Kitakyushu Eco-Town, a local biotope, AMITA Corporation, JPEC and Nishihara Corporation. The delegates strengthened the relationship between the two cities by visiting two monks from Myanmar living at the World Peace Pagoda and the Deputy Mayor of Kitakyushu, Mr. Kazuhide Umemoto.¹⁴ Further collaboration was discussed as well during the study tour. Mandalay proposed that Kitakyushu would organise a solid waste management and environmental education workshop in Mandalay in the following months. This activity was in line with the environmental education activities planned under the ASEAN ESC Model Cities Programme.

Then, in November 2014, only two months after the study tour, a two-day workshop was organised at the MCDC which aimed to enable diverse groups and

individuals to learn and work together in identifying key challenges and possible actions to introduce the concept of the 3Rs (Reduce, Reuse and Recycling) before disposal of the waste in a collaborative manner. Toward the end of the workshop, the participants determined that the concept of the recycling society and the application of participatory learning workshop are all new ideas for the Cleansing Department of the MCDC. In addition, further technical assistance from IGES, Kitakyushu City and the ASEAN ESC Model City Programme was found to be essential. Thus, both MCDC and Kitakyushu City representatives agreed to find potential for developing a joint proposal for JICA or other funding.¹⁵

3.2.2. Spotlighting cooperation between Kitakyushu and Mandalay

The collaborative activities between Kitakyushu and Mandalay were placed under the spotlight and brought to national attention at the 4th Myanmar Forum on Green Economy / Green Growth (GEGG), which was held successively in Nay Pyi Taw and Mandalay in February 2015.¹⁶ Approximately 400 people gathered at the Nay Pyi Taw forum attended by President Thein Sein. During their speeches, the Governor of Mandalay and Chairman of the GEGG Myanmar Association acknowledged the city-to-city cooperation relationship between Kitakyushu and Mandalay. The history and achievements of cooperation between the two cities have been shared with a wide audience and further collaboration activities are expected.

In Mandalay, IGES facilitated a panel discussion. This session concluded that in order to raise public awareness on waste management, education could start at school by learning from the experience in Kitakyushu. Based on this result, both cities agreed that a new environmental education system could be developed as the next collaborative action between the cities of Kitakyushu and Mandalay.¹⁷

On this occasion, an awards ceremony, the "Green, Clean, Mandalay Environmental Essay Contest" was organized in Mandalay. Representatives from IGES and Kitakyushu participated as presenters. The contest itself was held in January and sponsored by the MCDC, Ministry of Education, and Ministry of Science and Technology in cooperation with the Japan ASEAN Integration Fund (JAIF), IGES, and the City of Kitakyushu.¹⁸



Figure 3.5.4. Identification of major challenges (above) and participants in the planning workshop (below)

14 ASEAN ESC Model Cities. (2014b). Mandalay's Environmentally Sustainable City Study Tour in Kitakyushu, Japan. Retrieved October 4, 2017, from <https://aseanmodelcities.org/news/mandalays-environmentally-sustainable-city-study-tour-in-kitakyushu-japan/>
 15 Premakumara, D. G. J., & Nakamura, M. (2014). Participatory Learning Workshop: Application for designing a municipal solid waste management model project in Mandalay City, Myanmar. Kitakyushu. Retrieved from <https://pub.iges.or.jp/pub/participatory-learning-workshop-application>
 16 IGES. (2015a). Aiming to be an ASEAN ESC Model City: Potential for intercity cooperation between the cities of Mandalay and Kitakyushu in the waste sector. Organisation of Mandalay session. Retrieved October 4, 2017, from <https://www.iges.or.jp/jp/sustainable-city/20150206.html>
 17 IGES. (2015a). Ibid.
 18 IGES. (2015b). Attendance at Green, Clean, Mandalay Environmental Essay Contest award ceremony. Retrieved October 4, 2017, from https://www.iges.or.jp/jp/sustainable-city/20150206_2.html



Figure 3.5.5. Leaders (left) and participants (right) at the Myanmar Forum on GEGG

3.2.3. Development of waste management strategies

In 2016, an agreement was made to develop waste management strategies at the national and city level. Mandalay was selected as target city for the development of strategies at the city level. As a result, the Ministry of Natural Resources and Environment Conservation (MONREC) of Myanmar, the United Nations Environment Programme's International Environmental Technology Centre (UNEP-IETC) and the IGES – Centre Collaborating with UNEP on Environmental Technologies (CCET) worked together to organise Myanmar's first Workshop on the Development of National Waste Management Strategy

in June 2016 in Nay Pyi Taw.¹⁹ This major event was followed by another workshop organised in collaboration with MDCDC to formulate a waste management strategy at the city level.²⁰ The second workshop was held in Yangon in December 2016, followed by the second workshop in Mandalay. The workshop aimed to develop a final draft for waste management strategies and an action plan.²¹ Kitakyushu contributed by providing resource persons and experts at the strategy development workshops in Mandalay and is also currently helping Mandalay with the implementation of the pilot project.

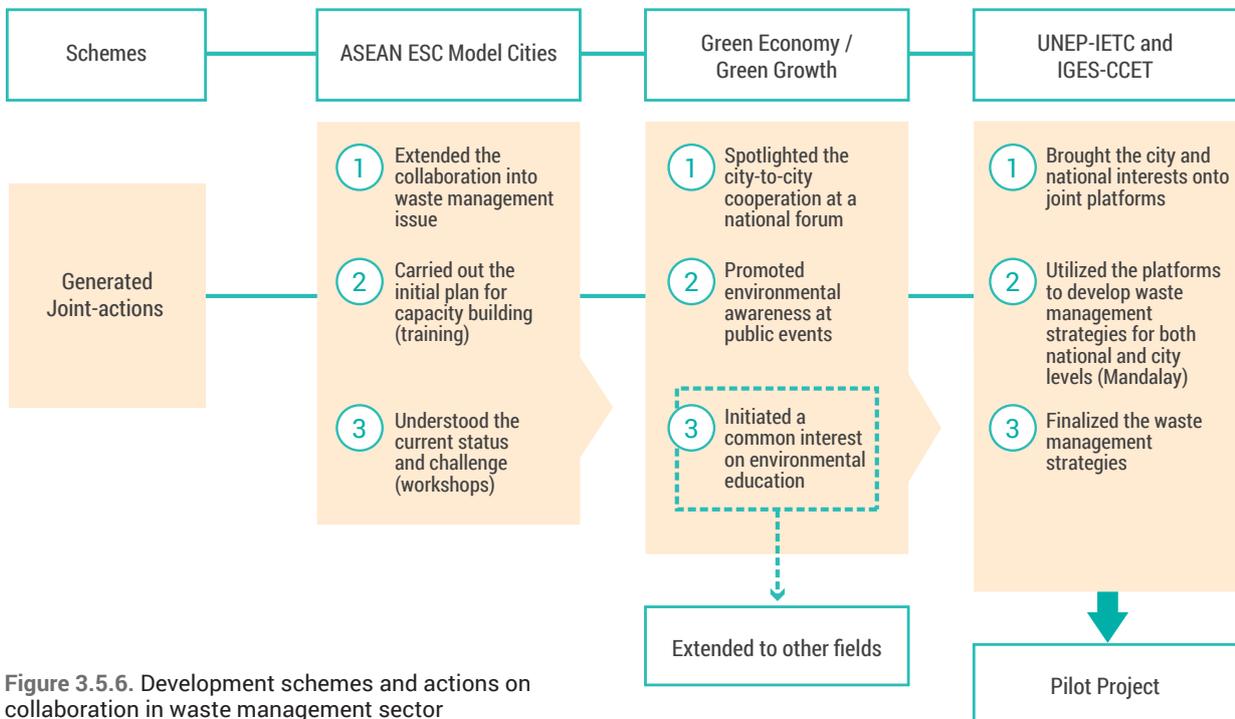


Figure 3.5.6. Development schemes and actions on collaboration in waste management sector

19 May Tin Hlaing, O., Onogawa, K., Premakumara, D. G. J., & Hengesbaugh, M. (2016b). Workshop Report on the Development of National Waste Management Strategy for Myanmar. In *First Workshop on the Development of Myanmar's National Waste Management Strategy, 13-15 June 2016, Nay Pyi Taw*. Hayama: Institute for Global Environmental Strategies. Retrieved from <https://pub.iges.or.jp/pub/first-workshop-development-myanmars-national>

20 May Tin Hlaing, O., Onogawa, K., Premakumara, D. G. J., & Hengesbaugh, M. (2016a). Workshop Report on the Development of Municipal Waste Management Strategy for Mandalay. In *First Workshop on the Development of Mandalay City's Municipal Waste Strategy, 16-17 June 2016, Mandalay*. Hayama: Institute for Global Environmental Strategies. Retrieved from <https://pub.iges.or.jp/pub/first-workshop-development-mandalay-citys>

21 May Tin Hlaing, O., Onogawa, K., Premakumara, D. G. J., & Hengesbaugh, M. (2017a). Second Workshop for the Finalization of City Waste Management Strategy and Action Plan. In *Second Workshop for the Finalization of City Waste Management Strategy and Action Plan for Mandalay 8 December, Mandalay* (pp. 1–110). Hayama: Institute for Global Environmental Strategies. Retrieved from <https://pub.iges.or.jp/pub/second-workshop-finalization-mandalay-citys>

3.3. Environmental education

Kitakyushu is one of the leading sustainable cities in Japan that gained its success through an environmental education programme for the citizens. MCDC has been mainstreaming waste reduction at source which correlates with environmental knowledge and a sense of responsibility as well. There is an urgent need for Mandalay to build the capacity of citizens by introducing an approach such as Environmental Education (EE) and to learn from Kitakyushu.²²

This initiative began with a study on the current status of environmental education between 2015 and 2016. Based on this study, IGES developed an environmental education tool, which was a Mandalay version of “Ecology Note” that had originally been developed by Kitakyushu.²³ Ecology Note provides information, tools and guidelines for reducing, reusing, recycling, and composting waste and using landfills or other technologies to dispose of residue in a more environmentally-sound manner. The learning materials also provide students with valuable lifelong tools and encourage them to be active citizens by making small changes, as well as ideas on how to incorporate solid waste management into other subjects in the classrooms. A training workshop for teachers in three model schools was also organised to provide guidance on utilising the Ecology Note for environmental education.²⁴

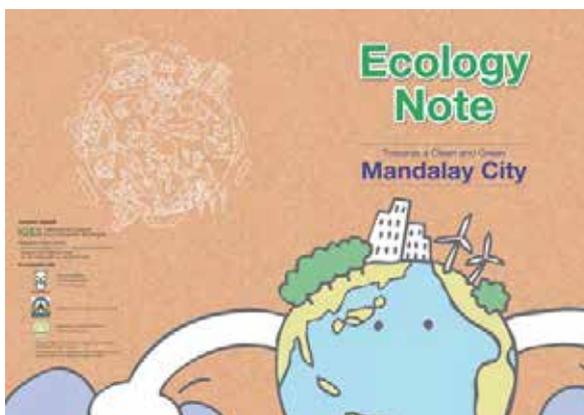


Figure 3.5.7. Mandalay version of “Ecology Note”

An online exchange event between schools in two cities was also organized during the study period. A Skype meeting was arranged by IGES KUC to bridge the gap and allow students at Hayatomo Junior High School in Moji, Kitakyushu, which is an UNESCO Associated School, and the students of Basic Education High School (BEHS) No. 26 in Mandalay to share their feelings and knowledge. This meeting deepened the connection between Kitakyushu and Mandalay to something that went beyond cooperation at the administrative level. This kind of opportunity can

also be regarded as a benefit to the citizens of Kitakyushu.

The next step during the following year was to expand the application of the Ecology Note from three to 18 model schools. IGES organised a training workshop for teachers in 18 model schools to gain new knowledge and skills on how to use the Ecology Note. Furthermore, IGES organised a training workshop for citizens and city officials in a model community on how to use participatory tools to raise awareness on waste separation at source. In 2017, a sample survey on environmental knowledge and the level of awareness of students was conducted to evaluate the outcome of this initiative.²⁵



Figure 3.5.8. Interaction of students in Mandalay (above) and Kitakyushu (below) via Skype

This project aimed to build the capacity of teachers, other individuals and organizations to incorporate the principles into concrete learning and actions based on cultural values and traditional practices. However, it is important to develop a sustainable system for introducing this learning material into the current education system. Additionally, the networks among related organisations must be expanded and partnerships to facilitate mutual learning and resource sharing must be created. It is also important to institutionalise environmental education in order to expand the use of Ecology Note in all schools, and then to institutionalise waste separation and 3R activities

22 Premakumara, D. G. J., Kataoka, Y., & Chowdhury, M. (2016). Development of Environmental Learning Programme for Establishing a Sustainable Solid Waste Management System in Mandalay City, Myanmar. In The HDCA 2016 Conference: Capability and Diversity in a Global Society 1-3 September 2016, Hitotsubashi University, Tokyo (pp. 1–13). Retrieved from <https://pub.iges.or.jp/pub/development-environmental-learning-programme>

23 Premakumara, D. G. J. (2016a). Ecology Note. (M. Chowdhury, Y. Kataoka, & S. Gilby, Eds.). Institute for Global Environmental Strategies, City of Kitakyushu, Mandalay City Development Committee (MCDC). Retrieved from <https://pub.iges.or.jp/pub/ecology-note-towards-clean-and-green-mandalay>

24 Premakumara, D. G. J. (2016b). Environmental Education and Learning Materials for a Smart and Green Mandalay City. *CityVoices*, 7(2), 14–18.

25 Premakumara, D. G. J., & Chowdhury, M. (2017). Environmental Education (EE) as an Entry Point for Realising a Sustainable City through City-to-City Cooperation. In *FY 2016 International Environmental Cooperation Basic Training, 6 February 2017, Kitakyushu City* (pp. 1–40). Institute for Global Environmental Strategies. Retrieved from <https://pub.iges.or.jp/pub/environmental-education-ee-entering-point>

in the waste management strategy of Mandalay City. These are the current targets for the implementation of this project.²⁶

3.4. Energy and low-carbon

In 2017, the collaboration between Kitakyushu and Mandalay expanded to other fields of development. Under the “City-to-City Collaboration for Low Carbon Society” by the Ministry of the Environment, Japan (MOEJ), the Kitakyushu Asian Center for Low Carbon Society, City of Kitakyushu, private sector and MCDC initiated a feasibility study on the introduction of energy conservation

technologies and renewable energy in Mandalay. This programme aims to contribute to the development of Mandalay by introducing low-carbon technologies to large-scale facilities, such as hotels and public facilities. In fiscal 2017, feasibility studies were carried out on the power generated by utilising regional biomass from agricultural waste and livestock excreta and energy conservation using air-conditioning equipment and photovoltaic power generation systems. By sharing knowledge on the low-carbon city development of Kitakyushu City in this programme, Business-to-Business (BtoB) collaboration is also expected to be an outcome of this collaboration.

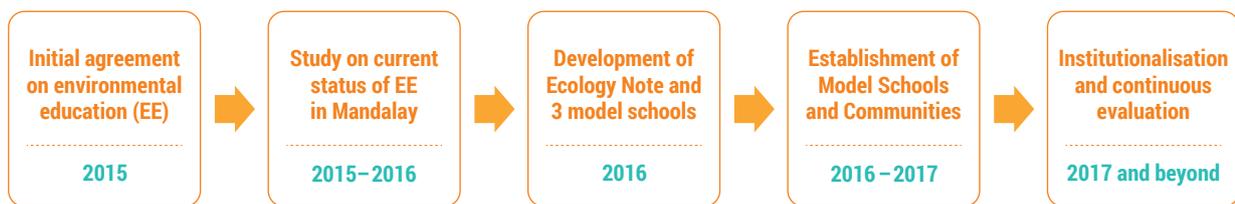


Figure 3.5.9. Development phase of collaboration in environmental education

4 Achievements from intercity cooperation

Collaboration with Mandalay was one of the most recent city-to-city cooperation activities established by Kitakyushu. As soon as the exchange started in 2013, concrete measures were developed the following year, and the sense of speed of this city-to-city collaboration is worth noting. In the beginning, cooperation was developed around the improvement of water and sewerage quality in 2014, followed by collaboration in the sectors of waste management, environmental education, energy and low-carbon in the next years. This development shows that the city-to-city collaboration between Kitakyushu and Mandalay has had impacts and achievements, since more and more sectors are becoming involved and the scale of the collaborative projects has increased.

This direct relationship between the two cities, which are being widely acknowledged at the national and international level, has proven to be in line with the diplomatic relations between Japan and Myanmar as explained at the beginning of this case study. As also mentioned earlier, Kitakyushu has been supportive since the start of development nationwide in earlier years and is making significant efforts to share knowledge, experiences and other resources, especially in Mandalay. This initiative by Kitakyushu does not only help maintain its reputation as the World Capital of Sustainable Development but also generates many opportunities for future and wider collaborative actions involving not only governmental entities but also other urban stakeholders. This kind of collaboration is expected to contribute to improving the urban environment in Mandalay and, simultaneously, develop water and low-carbon business for Kitakyushu.

²⁶ Ibid.



Chapter 4

Contributing to a Sustainable Society through Intercity Cooperation in True "Kitakyushu Style"



Contributing to a Sustainable Society through Intercity Cooperation in True “Kitakyushu Style”

Although the events that set in motion the collaboration between Kitakyushu and the five Asian cities vary as mentioned in Chapter 3, it is noteworthy that concrete cooperative activities started almost immediately after in all cases. Moreover, once a cooperative relationship had been established, activities expanded into various fields and lasted for a substantial amount of time. In this chapter, the factors that make such activities possible for Kitakyushu are clarified and the future directions of intercity cooperation are discussed.



1 Factors that characterize intercity cooperation in Kitakyushu City

The factors that make Kitakyushu’s intercity cooperation unique and its relationship with Asian cities “continuing, expanding and intensifying” are embodied in the following seven points: (1) policy positioning, (2) collaboration with diverse set of stakeholders, (3) creation and systematization of contents provided, (4) utilisation of external funds, (5) communication with collaborating cities, (6) domestic and overseas assessment and (7) benefits to the city. Each factor is discussed based on case studies of cooperation with five Asian cities.

Factor 1 Policy positioning

As intercity cooperation has been carried out continuously for nearly 40 years, its meaning has also changed for Kitakyushu over time, taking into account local and national conditions.

Intercity cooperation in Kitakyushu began in 1979 when the city concluded a friendship agreement with Dalian and started a pollution management course in 1981 in response to local needs. In the early 1980s, international exchange activities were in full swing between sister cities, mainly with cities in Europe and the United States (Figure 4.2). Since there were very few international cooperation activities or international exchange between

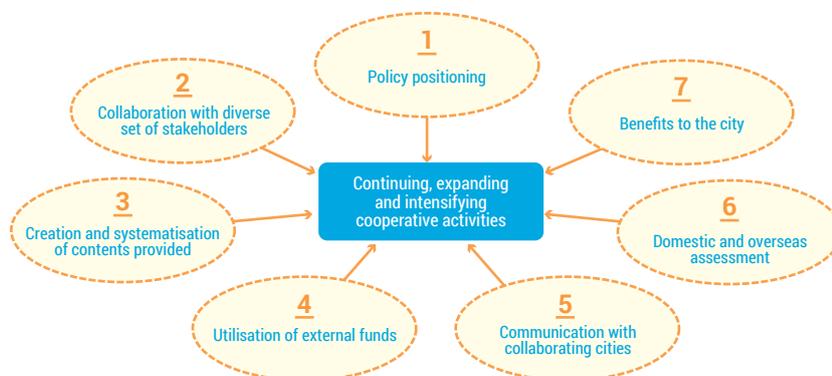


Figure 4.1. Seven factors that form the characteristics of Kitakyushu’s intercity cooperation

cities in Japan and Asia, the start of intercity cooperation between Kitakyushu and Dalian blazed a trail for the future of international collaboration. At that time, intercity cooperation was not clearly positioned in the comprehensive master plan of Kitakyushu City; therefore, cooperative activities were led by the private sector, mainly by the Kitakyushu International Techno-cooperative Association (KITA), under the framework of friendship city agreements.

As the city was steadily gaining experience through intercity cooperation with Dalian, Kitakyushu started to become aware of the international image it wished to portray for itself in the 21st century as stated in the Kitakyushu Renaissance Master Plan formulated in 1988 (Figure 4.3). The foundation of international environmental cooperation in the city improved based on various initiatives (Table 4.1). It was also around this time that the JICA Kyushu International Center (JICA/KIC), with which Kitakyushu City collaborates in developing international environmental cooperation activities and business, was established and the first official involved with international environmental cooperation was assigned to the Pollution Countermeasures Bureau (present-day Environment Bureau).

In the 1990s, the Earth Summit (1992) became the impetus for the formulation of “Agenda 21 Kitakyushu” (1996), an action plan for promoting regional environmental conservation, the “Kitakyushu City Basic Environmental Ordinance” (2000) based on Agenda 21 Kitakyushu, and the Grand Design of the World Capital of Sustainable Development¹ (2004), which shows the will of the city’s

residents to realize the goals of creating a World Capital of Sustainable Development. Communicating Kitakyushu’s efforts on environmental conservation to the world was commonly regarded as one of the environmental actions to be taken by the city’s residents in the Grand Design. Around that time, the “Kitakyushu Conference of Environmental Cooperation Among Cities in the Asian Region” (1997) and the “4th Ministerial Conference on Environment and Development in Asia and the Pacific” (2000) were both held in Kitakyushu. The Environmental Cooperation Network of Asian Cities (six cities in four countries) and the Kitakyushu Initiative Network (62 cities in 18 countries) were also established at that time as a result of those meetings. In this way, international cooperation activities were actively promoted to contribute to the improvement of the Asian environment through intercity cooperation. Collaboration with Surabaya (1997–present) and Phnom Penh (1999–present) started at a time when the momentum of such bottom-up efforts was building. In both cases, a clear cooperative framework did not form right at the start; rather, cooperative activities were promoted for a specific sector (waste management sector in the case of Surabaya and water supply sector in the case of Phnom Penh) in response to the needs of the partner city, and in the case of Phnom Penh, at the request of the Japanese government.

The achievements of international cooperation built up so far were recaptured as the strength and appeal of the city, and the city government laid out a policy for enhancing its brand as the “World Capital of Sustainable Development” and “Technology Capital of Asia” in the current comprehensive master plan, “Energetic Start! Kitakyushu

Table 4.1. City images and measures related to the international cooperation activities and business sectors listed in the Kitakyushu Renaissance Master Plan

City image	Measures	Concrete example
International technical information city creating the industries of tomorrow	Promotion of international training projects	Improvement of the environment and facilities for accepting trainees
	Promotion of the development of a transportation system that supports industrial activities	Development and improvement of a new airport, wide-area highways and ports
Thriving city of exchange spreading out to the sea	Promotion of logistics and trade	Organization of international trade fairs, development of local products, etc.
	Development of a convention city	Improvement of international convention zones, improvement of environment for conventions and enhancement of convention functions
Academic and research city in Asia open to the future	Promotion of international exchange	Development of international exchange platform, international exchange with public participation, attraction of foreign universities and promotion of sister city exchange etc.
	Attraction of various research organizations and promotion of development	Attraction of various research institutions, promotion of development, promotion of the development of research environments, etc.
	Attraction of higher educational institutions, such as universities, and promotion of development	Attraction of universities, improvement and enrichment of existing universities, etc.
	Enrichment of The University of Kitakyushu	Improvement and enhancement of faculties and departments, development of responses to internationalization, open to citizens, and enhancement of research systems
	Formation of international academic and research zones	Formulation of a new “academic and research zone” construction plan, attraction of laboratories, research and development facilities, improvement of access necessary for setting up “academic research zones”

(Note) Other city images exist in addition to those described above: “Comfortable residential city making use of its green environment and waterfront” and a “Healthy and rewarding welfare and cultural city”.

¹ The official name is the “Commitment of the Residents of Kitakyushu to All People, the Earth and Future Generations “Towards the creation of a “World Capital of Sustainable Development” (Grand Design).”

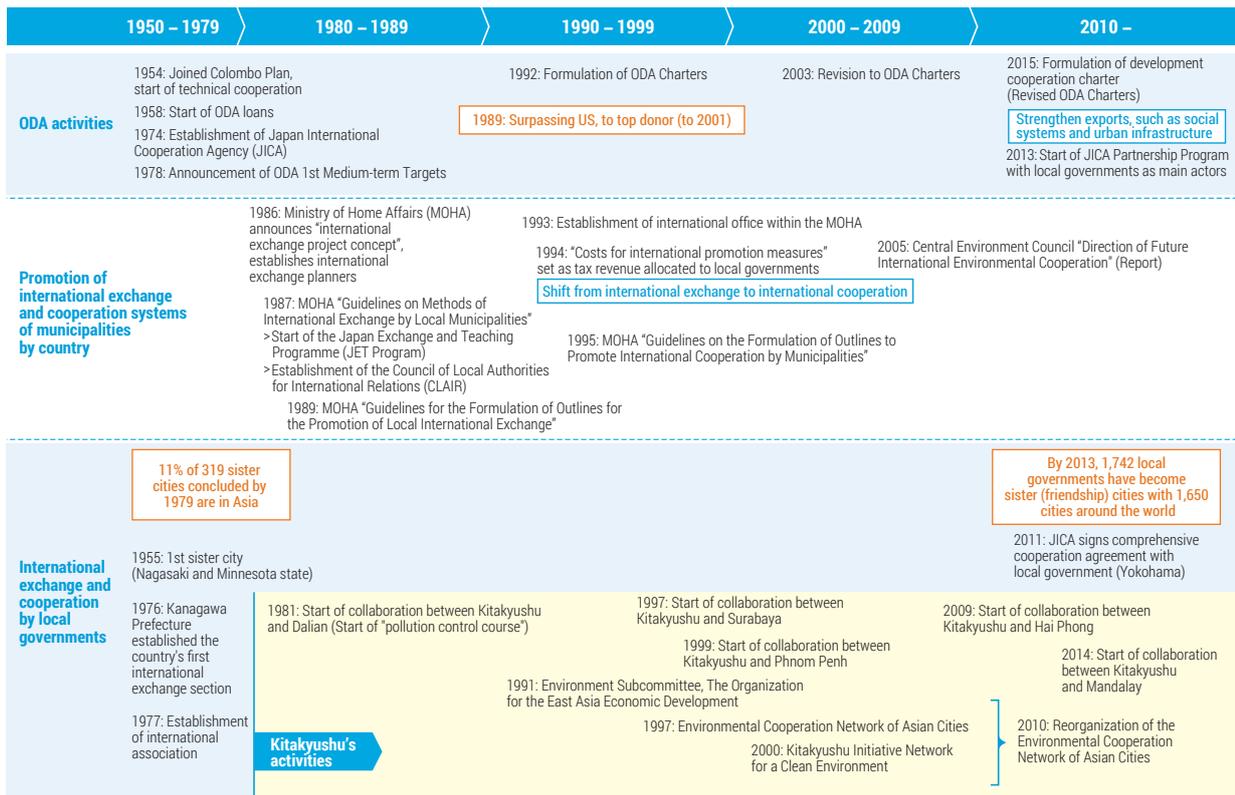


Figure 4.2. National policies on international cooperation by local governments in Japan and their trends

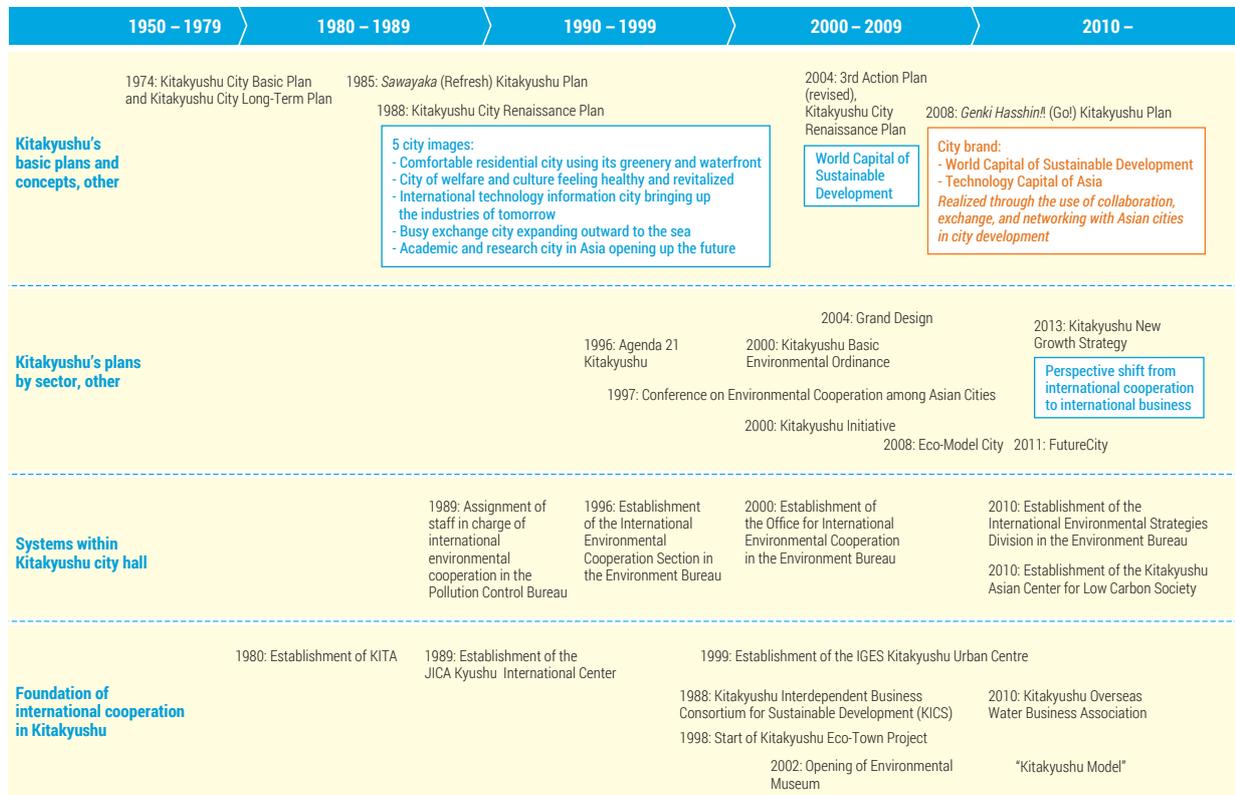


Figure 4.3. History of policies and infrastructure development related to intercity cooperation in Kitakyushu

Plan” (2008). Moreover, international environmental business was also being promoted one step further from international environmental cooperation by positioning the “development of urban infrastructure business to contribute to Asia” and create an “advanced industrial city in the region for the development of new technologies and a prosperous life”, as stated in the “Kitakyushu New Growth Strategy” (2013). Collaboration with Hai Phong (2009-present) and Mandalay (2012–present) started around this time, and cooperative activities were planned with a view to develop environmental business from the very start of collaboration. In the case of Mandalay, cooperation activities were promoted in the absence of a clear cooperative framework, while in Hai Phong, both cities signed a friendship and cooperation agreement (2009) at the start of exchange and cooperation activities were carried out under a framework of international cooperation in the environment, water supply and sewerage sectors.

As the governments of Japan and Kitakyushu launched policies to support the development of environmental businesses around 2010, all cases of city-to-city cooperation have been expanded into sectors with business elements in mind (see pp. 18, 28, 36, 46, 55). In addition, clear cooperative frameworks such as agreements or memoranda of cooperation are being developed more often than ever between two cities, which in turn, has secured continuous and comprehensive cooperation in various sectors.

Kitakyushu City has gradually positioned policies related to intercity cooperation in the city’s comprehensive master plan and administrative plans by sector in line with national policies, social situations and the intentions of its citizens. At the same time, the foundation and implementation system for international environmental cooperation of the city have been improved with Kitakyushu’s commitment to continuous and comprehensive cooperative activities with Asian cities. Today, intercity cooperation is regarded as a strategy embodying the goals of the “World Capital of Sustainable Development” that contributes to environmental improvement in response to the needs of cooperating cities. The promotion of local industries is also regarded as policy by utilizing the city’s strengths, namely, the know-how of environmental administration and environmental technology (*monozukuri*), and as a result, developing a win-win relationship for both cities.

Factor 2 Collaboration with diverse set of stakeholders

It is necessary to formulate an appropriate implementation system in order to respond precisely to the needs of counterparts in intercity cooperation. Kitakyushu has had experience collaborating with partners, such as KITA,

JICA, and local companies, since the early stages of international cooperation, and can formulate an adequate implementation system according to the context of cooperation in collaboration with diverse stakeholders in and outside the city. For example, the Kitakyushu city government collaborated with JICA, KITA and local companies in an effort to formulate an ODA project in Dalian as the very first local government in Japan. Kitakyushu city government, JICA, KITA, IGES, and experts engaged in the implementation of a compost project in Surabaya. Kitakyushu city government and two companies formed a joint venture for the first water service project in the capital of Phnom Penh and succeeded in becoming the first local government in Japan to take part and win in an open bidding process. Furthermore, when accepting trainees and conducting site visits, it is possible to provide trainees with relevant information and visit sites that are in line with their objectives by collaborating with local stakeholders such as private companies, universities and NGOs. In this way, the fact that Kitakyushu has been able to continuously develop collaborative activities over a wide range of sectors can be said to be a result of the stakeholders’ capacity to form an optimal team according to the needs of their partners and the purpose of the projects.

Table 4.2 shows examples of stakeholders, with which the Kitakyushu city government can collaborate in intercity cooperation. There are a wide range of stakeholders such as administrative organizations, UN agencies, private sector associations, financial institutions and academic institutions. With the start of promoting environmental businesses around 2010, the city government concluded cooperation agreements and memoranda with various agencies in Japan to further strengthen their cooperative relationships. Regular information sharing has been promoted among such organizations, and the human networks and expertise of each member are also shared locally. In particular, the Kitakyushu Asian Center for Low Carbon Society, which was established in 2010 as an organization to realize a low-carbon society in Asia by promoting international environmental cooperation and environmental business, consists of representatives from the Kitakyushu city government, KITA and IGES/KUC; all of these stakeholders are located in the same building and within walking distance from the JICA/KIC. Therefore, close communication can also be enhanced physically.

A new development in city-to-city cooperation is the expectation of the development of cooperation between NGOs in Kitakyushu and Surabaya. Likewise, intercity cooperation is expected to be further enhanced by carrying out cooperation activities among citizens in addition to traditional inter-administrative (G-to-G) and inter-company (B-to-B) collaboration.

Table 4.2. Stakeholders related to intercity cooperation in Kitakyushu

Type	Name of organization
Administrative agency / corporation	<ul style="list-style-type: none"> ● International Environmental Economic Affairs Department, Environment Bureau, City of Kitakyushu ● Asian Center for Low Carbon Society (composed of the City of Kitakyushu (International Environmental Strategies Division, International Environmental Economic Affairs Department, Environmental Bureau, KITA and IGES.) ● Kitakyushu International Techno-cooperative Association (KITA) ● Kitakyushu Urban Centre, Institute for Global Environmental Strategies (IGES) ● Kitakyushu Foundation for the Advancement of Industry, Science and Technology ● Japan International Cooperation Agency (JICA) Kyushu International Center ● <i>A comprehensive partnership agreement was concluded in February 2013</i> ● Japan External Trade Organization Kitakyushu Office ● <i>A comprehensive partnership agreement was concluded in July 2013</i> ● United Nations Industrial Development Organization (UNIDO) ● <i>An MoU on mutual collaboration for the realization of a low-carbon society was concluded in June 2010</i> <p style="text-align: right;">Other</p>
Private groups / private companies	<ul style="list-style-type: none"> ● Kitakyushu Interdependent Business Consortium for Sustainable Development (KICS) ● Kitakyushu Overseas Water Business Association ● Kyushu Recycle and Environmental Industry Plaza (K-RIP) ● <i>An MoU on mutual collaboration and cooperation for the promotion of environmental businesses in the Asian region was concluded in June 2010</i> ● Japan Bank for International Cooperation ● <i>An MoU for cooperation on climate change mitigation and water infrastructure development was concluded in December 2009</i> ● Sompo Japan Nipponkoa Insurance Inc. ● <i>An agreement on comprehensive collaboration on the environment and SDGs was concluded in February 2018</i> ● The Kitakyushu Chamber of Commerce and Industry <p style="text-align: right;">Other</p>
Academic organizations	<ul style="list-style-type: none"> ● The University of Kitakyushu ● Kyushu Institute of Technology <p style="text-align: right;">Other</p>

(Note) Sentences in blue indicate a collaboration agreement concluded with the City of Kitakyushu.

Factor 3 Creation and systematisation of contents provided

Intercity cooperation in Kitakyushu started with the buildup of urban management know-how and environmental technology developed during the process of overcoming pollution, and the city's desire to transfer that information. Since its own journey to overcome pollution, Kitakyushu has been working on various measures to build a recycling-oriented society aiming at reducing waste and greenhouse gases emitted within the city area and to build a low-carbon society. Know-how and technology are also built up in this process. Kitakyushu City has systematized this collective know-how and technology into the "Kitakyushu Model for Exporting the Concept of Green Cities" (Kitakyushu Model) so that they can be disseminated widely (see page 11). It is possible to provide optimal and comprehensive urban solutions for the needs of cooperating cities by utilizing the Kitakyushu Model. The city government is also trying to create business opportunities for local companies by participating in "upstream" planning processes, such as the development of master plans in cooperating cities. For example, the "Hai Phong Green Growth Action Plan" (May 2015) jointly formulated by Kitakyushu and its sister

city of Hai Phong, and the "Phnom Penh City Climate Change Strategic Action Plan" (March 2016) formulated in collaboration with Kitakyushu's sister city, Phnom Penh, are good examples of how the Kitakyushu Model has been applied. With technical assistance related to water supply, it is possible to help businesses expand because local stakeholders in Kitakyushu can be deeply involved in determining the specifications of facilities by participating in the decision-making process from the beginning phase of creating master plans.²

Cities overseas, including in Asia that are continuing to undergo rapid economic development and urbanization, still maintain a keen interest in Kitakyushu's know-how on overcoming environmental pollution, Eco-Town projects, and waste management. To take advantage of Kitakyushu's knowledge and experiences, many trainees and visitors visit the city. A total of 9,083 international trainees from 165 countries have been accepted by KITA for participation in JICA projects since the organization first opened its doors in 1980.³ Kitakyushu has improved the environment for accepting trainees and visitors in order to promote more efficient and comprehensive understanding of the city's history and the environmental measures taken by Kitakyushu.

² Nishinippon Shimbun, Morning edition. "Water Business' of Kitakyushu City in top condition / Cambodia's Water Treatment Plant / The second overseas order received", August 26, 2011.

³ Achievement as of March 31, 2018. Source: Kitakyushu International Techno-cooperative Association. "KITA Introductory Brochure". Issued in April 2018.

Today, Kitakyushu has learning facilities such as the Kitakyushu Environmental Museum, Kitakyushu Eco-Town Center, and Water Plaza Kitakyushu, as well as incineration facilities, recycling centers, and recycling companies in Kitakyushu Eco-Town, where visitors can also see actual operations on site. As shown in the case studies of the five Asian cities, officials from cooperating cities are often invited to Kitakyushu as part of capacity building programs once intercity cooperation has started, and such facilities help make inroads to a comprehensive understanding of Kitakyushu’s history and policies. The contents of the learning facilities are also in turn enhanced by the visitors themselves. These facilities are not only accepting overseas visitors, they are also being used for environmental education of students in elementary schools in and outside the city. These facilities are also used to promote environmental education for Kitakyushu’s citizens and help them understand the international environmental cooperation activities being carried out. In this way, Kitakyushu has formed a system to promote comprehensive understanding by organizing the know-how developed in the city as the Kitakyushu Model, and at the same time, by enriching learning facilities in the city. This environment allows Kitakyushu to continuously carry out intercity cooperation in various sectors using the Kitakyushu Model to actively address the environmental problems in cooperating cities, and then establishing a system that allows that know-how to be shared with those who need it at any time.

Factor 4 Utilisation of external funds

Funds are needed for the implementation of intercity cooperation activities. Kitakyushu actively makes use of the international cooperation support schemes of JICA and the Japanese Ministry of the Environment. For example, in collaboration with Dalian, the support schemes of JICA and CLAIR were used in the water sector, and in the case of Surabaya, JICA, JBIC, the Global Environment Fund were used for the waste sector. The continuity of intercity cooperation is secured by obtaining funds from multiple institutions, although as long as external funds are used, the project must be designed so that it follows along with the intentions of the donors. Kitakyushu can develop proposals in line with their own intentions and the objectives of donors, make suggestions in response to the needs of cooperating cities, and formulate an appropriate implementation system after consultation with stakeholders in the city. This balance can be regarded as one of Kitakyushu’s strengths. Leading roles can be taken not only by the Kitakyushu city government, but also by local stakeholders, depending on the type of project.

When a new business or project is launched in the field of international cooperation that takes the achievements of cities into account, Kitakyushu is often contacted by the Japanese government and international organizations for input based on their experience and knowledge. For example, the start of cooperation with Phnom Penh was due to a request for cooperation from the Japanese government.

Local stakeholders such as JICA also strive to understand the latest situations and trends, so that information can be shared regularly among stakeholders and appropriate proposals can be developed in a timely manner for funding schemes.

Factor 5 Communication with cooperating cities

One of the features of intercity cooperation in Kitakyushu is the development of tailored responses. To accomplish this, close communication with cooperating cities is essential, and in this way, it is possible to acquire the trust of counterparts and accurately grasp their needs at the same time. Since not all stakeholders in Kitakyushu and cooperating cities involved in intercity cooperation can communicate in a common language, Kitakyushu makes every effort to find proficient interpreters, translators and local consultants. The fact that the officials in Kitakyushu and cooperating cities communicate directly is also considered to be a major factor in facilitating intercity cooperation. The city officials communicate by e-mail, as well as on site by visiting the cooperating cities directly. Furthermore, the latest trends and needs of the local area are constantly updated as information collected is shared by stakeholders. Laying the foundation for such a system has a direct impact on improving the communication skills and international sense of stakeholders involved in intercity cooperation.

In recent years, cooperation activities have been carried out with the conclusion of a cooperation agreement or a memorandum of understanding. In this way, better communication and collaboration can be facilitated by clarifying the cooperation framework (Table 4.3).

Kitakyushu does not limit cooperation activities to only those cities that they are already working together with, but is actively trying to develop new relationships in concrete cooperative projects by interacting with a wide range of cities through city networks, including those pioneered by the city itself (Environmental Working Group of the Organization for the East Asia Economic Development (OEAED) and the Organization for City-to-City Environmental Cooperation in Asia) and other international city networks such as ICLEI - Local Governments for Sustainability.

Table 4.3. Examples of cooperation agreements between Kitakyushu and Asian cities

Month, Year	Cooperative city	Style of cooperation	Cooperation overview
May 1979	Dalian	Friendship city	Promote friendship exchange with China at the city level
May 2008	Dalian	MoU on circulation-type urban cooperation between China and Japan	Support for Qingdao, Tianjin and Dalian for Eco-Town Projects
April 2009	Hai Phong	Friendship and cooperation agreement	Acceptance of trainees from the Hai Phong city government, dissemination of Vietnam-centered business information focusing on Hai Phong, dispatch of economic mission teams, international cooperation in the environmental, water supply and sewerage sectors
March 2011	Surabaya	Joint statement on strategic environmental partnership	Partnership for facilitating further sustainable development of both cities
October 2011	Hai Phong	Agreement on water supply and sewer system development <Comprehensive agreement on water business> <Business agreement on water business>	<Comprehensive agreement on water business> Technical consultation on issues in water supply and sewer systems based on requests from Hai Phong <Business agreement on water business> Technical consultation when technical problems arise in developing water block distribution system
December 2011	Phnom Penh	MoU on basic water supply plans for nine major cities	Consultation on the formulation of basic water supply plans with the main objectives of improving the water supply rate in nine cities in Cambodia including Phnom Penh
November 2012	Surabaya	"Green Sister City" agreement	Building a cooperative relationship on the creation of a low-carbon society, the construction of a resource recycling system, and the training of personnel in both cities in order to effectively develop mutual benefits for the development of the two cities. Updated in September 2016.
April 2014	Hai Phong	Sister city agreement	Deepening cooperative relationships and friendship exchange for the development of both cities
November 2015	Hai Phong	MoU on promoting mutual exchange among managers of SMEs with Kitakyushu and Hai Phong	Continuation of economic exchanges between the two cities centered on overseas expansion of SMEs
January 2016	Phnom Penh	MoU on activities to promote the sustainable development of the Kingdom of Cambodia	Promoting Kitakyushu's public-private partnerships in Cambodia to achieve the national goal of "expanding water supply to all citizens in urban areas by 2030".
March 2016	Phnom Penh	Sister city agreement	Improvement of friendship through a wide range of exchange and cooperation
February 2017	Phnom Penh	MoU on technical cooperation and exchange in the sewerage sector	Promotion of technology exchange in the sewerage sector for the sustainable development of projects to improve the water environment and sewerage systems in Phnom Penh.

Source: Press releases from the City of Kitakyushu

Domestic and overseas assessment

Recognition from international organizations and cooperating cities is considered to be an important factor for promoting intercity cooperation, as it can lead to more commitment by mayors and raise the motivation levels of local stakeholders including city government staff. Since external assessments are usually conducted

on the basis of the results of cooperative projects, it is important to obtain visible outcomes. For example, as a result of collaboration with Dalian, the City of Dalian won the "Global 500 Award" for air pollution control measures. In collaboration with Phnom Penh, Kitakyushu helped to dramatically improve the water supply system which is referred to as the "Phnom Penh Miracle". In collaboration with Surabaya, local waste dropped 30% as a result of waste management measures, including the introduction

Table 4.4. International assessments on international environmental cooperation of Kitakyushu City

Year	Award, other (Organizer)	Contents
1990	Received “Global 500 Award” (United Nations Environment Programme (UNEP))	Appreciation for efforts to improve the local environment and international cooperation. * First municipality to be recognized in Japan.
1992	Received “Local Government Honours” at the United Nations Conference on Environment and Development (Earth Summit)	Appreciation for Kitakyushu’s contributions to sustainable development, environmental conservation and international environmental cooperation. *One of 12 cities in the world and the first municipality to be recognized in Japan.
2000	Adoption of the Kitakyushu Initiative for a Clean Environment at the Ministerial Conference on Environment and Development in Asia and the Pacific (MCED)	It was adopted as an initiative to improve the urban environment in the Asia-Pacific region by widely sharing Kitakyushu’s experiences. In addition, the “Kitakyushu Initiative for a Clean Environment” was stipulated in the agreement document of the World Summit on Sustainable Development (Johannesburg Summit) held in 2002.
2001	Friendship Award (Government of China)	Mayor of Kitakyushu received the award. * First mayor of a Japanese municipality to receive the award.
2002	Received “Earth Summit 2002 Sustainable Development Award” (England and the Royal Society of Arts / RSA et al.)	Mayor of Kitakyushu received the award. *Only two people in the world won this award.
2006	Xinghai Friendship Award (Dalian City)	Six staff from the Waterworks Bureau of City of Kitakyushu received this award.
2011	Grand Cross (Kingdom of Cambodia)	Contribution to the promotion of stable water supply in Cambodia.
2011	Selected as Green Growth City in OECD’s Green City program (OECD)	Kitakyushu was selected as an urban development model with a balance between the environment and economy. * Four cities in the world and the first municipality in Asia.
2015	Royal Order of SAHAMETREI, Grand Cross (Kingdom of Cambodia)	Assessment of accomplishments based on long periods of technical cooperation that contributed to the development of water infrastructure * First mayor of a Japanese municipality to receive this award.
2016	Adoption of the “Kitakyushu Initiative on Energy Security for Global Growth Joint Statement”.	Under the theme of “Energy security that supports global growth”, the initiative was adopted at the G7 Kitakyushu Energy Ministers Meeting as a joint statement after discussions on energy investment promotion, energy security enhancement and sustainable energy.
2017	Received a Special Award at the “1st Japan SDGs Award” (SDGs Partnership Award) (Sustainable Development Planning (SDGs) Promotion Headquarters)	The following aspects were evaluated: “international environmental cooperation” to promote environmental conservation according to the needs of the partner country, “international environmental business” such as water projects through public-private partnerships and “efforts by self-government associations and ESD” that aims to solve regional issues.
2018	Selected as a model city for promoting the SDGs (OECD)	Evaluation of Kitakyushu’s history of overcoming pollution and advanced measures to address environmental issues. * The program covers about 10 to 12 cities in the world. First municipality from Asia.

Note: Awards from partner countries/cities introduced in Chapter 3 are also included in Table 2.3 (Highlighted part).

of the Takakura composting project. These achievements and the development of such positive and generous cooperation projects have been highly commended by partner cities. In December 2017, the efforts of Kitakyushu including international cooperation were recognized and the city won a special prize at the “Japan SDGs Awards” (SDGs partnership award).

Such assessments are shared with citizens to enhance understanding on intercity cooperation, which then creates

a virtuous circle to develop human resources in the environment sector.

Factor 7 Benefits to the city

As Kitakyushu actively promotes intercity cooperation, it considers both the purpose of international environmental cooperation mentioned in Chapter 2, as well as the benefits

for stakeholders including citizens. The city government strategically commits to cooperative activities by clearly keeping in mind the direct benefits as well as ripple effects, such as strengthening the city's competitiveness, revitalization, inbound effects and promotion of internationalization in the city. Direct and indirect benefits for stakeholders in Kitakyushu can be seen by looking at examples of cooperation with five Asian cities (Table 4.5). Such perspectives are indispensable for intercity cooperation supported by citizens. Kitakyushu can be said to be successful in branding itself to some extent, since

the city's activities are highly acclaimed internationally and it has succeeded in attracting international conferences such as the "Ministerial Conference on Environment and Development (September 2000)" organized by the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP), as well as the G7 Kitakyushu Energy Ministerial Meeting (May 2016). In terms of economic development, it seems that certain effects are appearing, as there is a foundation for overseas development of local enterprises with the establishment of offices and networks in cooperating cities, as well as local companies supported

Table 4.5. Examples of benefits for stakeholders in Kitakyushu City

City	Examples of benefits
Collaboration with Dalian	<ul style="list-style-type: none"> ● Support for overseas deployment of city enterprises <ul style="list-style-type: none"> > Establishment of Dalian Office of Kitakyushu City > Organization of Dalian-Kyushu business meetings > Participation of city enterprises in development surveys (ODA / technical cooperation) ● Order for 200-million yen project to restore polluted soil at the site of pesticide factory ● Regular air flight service between Kitakyushu and Dalian cities ● Improvement of urban brand (Global 500 Award)
Cooperation with Phnom Penh	<ul style="list-style-type: none"> ● Support for overseas deployment of local enterprises <ul style="list-style-type: none"> > Opening of the Kitakyushu Overseas Business Support Center > Organization of the Japan-Cambodia Water Supply Seminar (annually since 2008) ● Order for "Siem Reap Water Supply Expansion Project / Detailed Design Work" (800-million yen contract) ● Human resource development of high school students in "Training to promote the understanding of water supply and sewage by young human resources" ● Improvement of urban brands (Introducing the "Phnom Penh Miracle" at the United Nations High-Level Political Forum)
Collaboration with Surabaya	<ul style="list-style-type: none"> ● Support for overseas deployment of local enterprises <ul style="list-style-type: none"> > In intermediate waste treatment, drinking water supply, environmental sanitation sector, etc. ● Promotion of exchange and cooperative activities at the civic level ● Increase in public awareness through the "reverse import" of Takakura composting ● Improvement of city brands (contribution to realizing a green city)
Collaboration with Hai Phong	<ul style="list-style-type: none"> ● Support for overseas deployment of local enterprises <ul style="list-style-type: none"> > Order for a consulting contract to improve the An Duong Water Purification Plant (approx. 20-million yen contract) > Demonstration projects for U-BCF in six cities in Viet Nam including Hai Phong (approx. 100-million yen contract) ● Improvement of city brands (support for formulating the Hai Phong Green Growth Action Plan)
Collaboration with Mandalay	<ul style="list-style-type: none"> ● Collaboration between a school in Mandalay and a junior high school in Kitakyushu via Skype ● Improvement of city brands (support for formulating a waste management strategy, support for environmental education)
Common in all city-to-city collaborations	<ul style="list-style-type: none"> ● Internationalization of the city <ul style="list-style-type: none"> > Improvement of acceptance system for trainees and site visits in the city > Building capacity of city government staff through experience in international projects > Strengthening partnerships among local stakeholders ● Improvement of brand recognition and inbound effects <ul style="list-style-type: none"> > Acceptance of about 9,000 trainees and site visits (achievements since the establishment of KITA) > Attracting international conferences ● Worldwide networks <ul style="list-style-type: none"> > Facilitates first contact with counterparts in overseas business development

by Kitakyushu, which have received orders for large-scale projects. Since stakeholders in Kitakyushu including the Asian Center for Low Carbon Society are conducting investigations in many Asian cities, more projects that result in improving urban environment in the cooperating cities and boost the business development of enterprises in Kitakyushu are expected to emerge.

2 Scaling up of intercity cooperation

Although Kitakyushu City is now collaborating with many cities, at the start of international cooperation with Dalian, they did not have any of the elements mentioned in the previous section. Kitakyushu was able to scale up their activities and gain support from local residents by expanding the city base by positioning it politically while also being conscious of the benefits to the city; establishing a system to allow a diverse set of stakeholders to cooperate organically; enriching contents that can be shared by addressing and systematizing environmental issues in the city; and receiving recognition both in and

outside of Japan through the support to cooperating cities in helping them address environment issues on site and appealing the benefits generated from those activities to its own citizens. In other words, Kitakyushu’s success was due to its strategy of maximizing effects by linking and utilizing limited external resources based on good governance (Fig. 4.4). Since the promotion of international environmental cooperation including intercity cooperation has always been positioned in policy, resources that can be utilized have increased in both diversity and scale and the capabilities of each individual have been built up, making it possible for Kitakyushu to develop an effective, efficient and tailored style of cooperation for many sectors.

However, even if the implementation system and know-how are enriched, it is not easy to achieve concrete results that will lead to environmental improvement in the cooperating city. The case studies that led to remarkable environmental improvement in cooperating cities, such as the improvement of air quality in Dalian, the “Phnom Penh Miracle”, and the drastic reduction of waste by promoting compost in Surabaya, featured factors in which the technical support from Kitakyushu matched local needs, local people were eager to address the issue

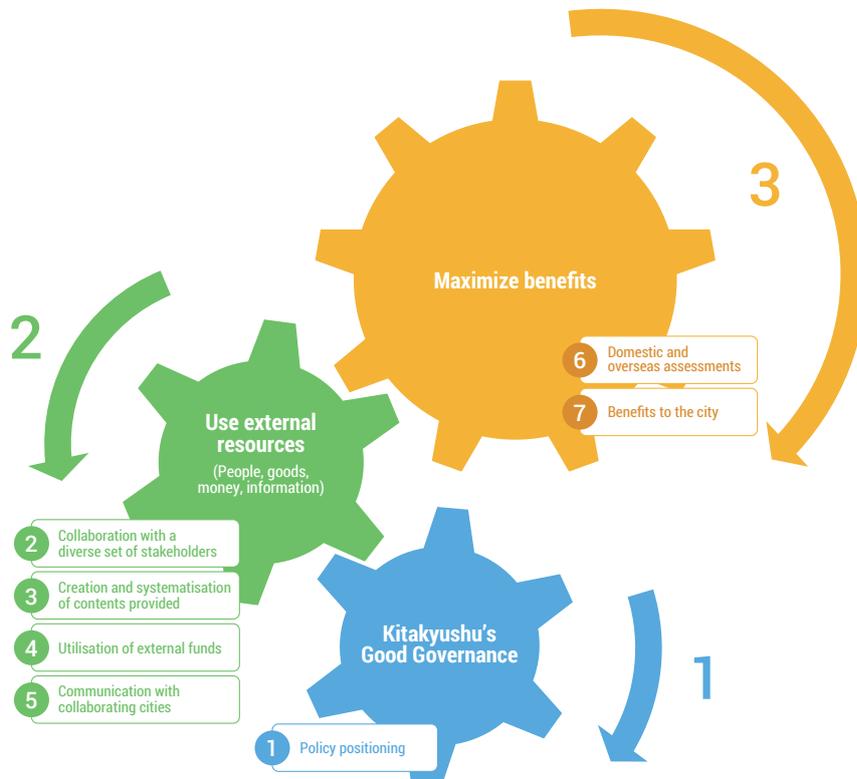


Figure 4.4. Mechanism for continuing, expanding and intensifying intercity cooperation

by themselves, and strong leadership was present. These factors are important for judging the effectiveness of intercity cooperation. For that purpose, communication and information sharing among stakeholders in Kitakyushu and cooperating cities are promoted in a multilayered manner, so that more opportunities can be generated for project development and the achievement of goals.

Kitakyushu also promotes collaborative international research in addition to conventional international technical cooperation based on recommendations in the report published by the OECD Green Cities programme, "Green Growth in Kitakyushu, Japan". The University of Kitakyushu has formed a collaborative research platform with Paris Diderot University (France), University of Chicago (USA) and Stockholm University (Sweden) and is promoting activities. Each university is located in a cooperating city (green growth city), and this kind of stakeholder and sector expansion appears to further contribute to Kitakyushu's own development.

Intercity cooperation requires a heavy investment of resources, and once it has started, both cities may find it difficult to dissolve the relationship even if they cannot find any benefit for each other. Nevertheless, if these opportunities are taken up positively, it will be a good chance to expand the perspectives of stakeholders

including city government staff, and to unleash the strengths of the city. The collective technologies in Japan can also be regarded as a good opportunity for local governments to pass down their technologies and know-how, as they can gain experience in developing an environmental infrastructure from the beginning with collaborating developing countries. Nowadays, such opportunities can rarely be found in Japan. In Kitakyushu, the partnership among stakeholders such as industry, the local government, academia and citizens had been developed in the process of overcoming environmental pollution. Today, that partnership has been further strengthened through intercity cooperation. As a result, a mechanism that organically promotes collaboration according to the purpose of the project has been developed. Such an environment cannot be developed overnight, but has been realized because activities have been carried out in a continuous manner. A partnership approach is emphasized in response to the urgent need to deal with international agendas targeting a wide range of complicated tasks such as the Paris Agreement and SDGs mentioned in Chapter 1. It is no exaggeration to say that the growth of partnerships through intercity cooperation is an irreplaceable asset for Kitakyushu.

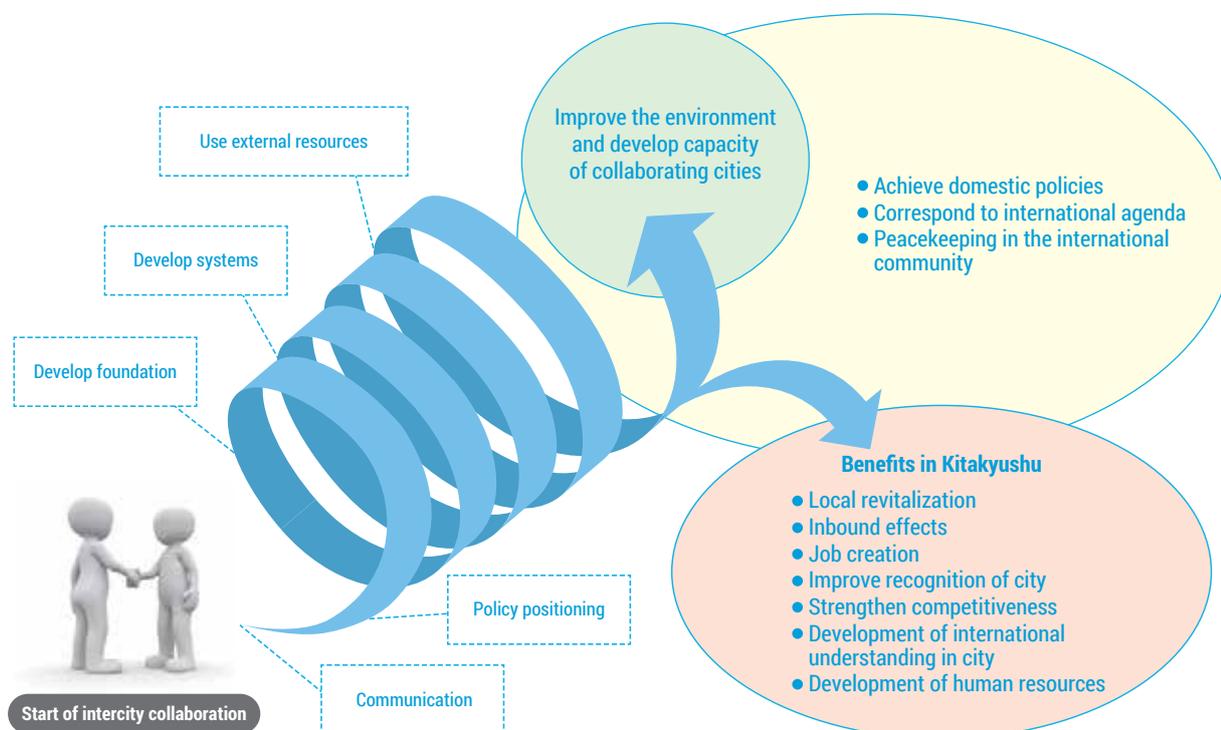


Figure 4.5. Image and effect of scaling up intercity cooperation

3 Future expectations for the realization of a sustainable society

Kitakyushu has not only made itself a sustainable city with an urban brand as a “World Capital of Sustainable Society” and “Technology capital of Asia”, but also as it strikes out on new paths in cooperation with Asian cities and growing together aiming at creating a sustainable society. The city continues to be a top runner in intercity cooperation, creating innovation as a city, and has gained various opportunities in its distinction as a trailblazer. In order for Kitakyushu City to further refine its city brand while scaling up intercity cooperation, and at the same time, obtaining benefits for itself, three recommendations are made here.

The first recommendation is to utilize the city’s experience and leadership in intercity cooperation not only in overseas cities but also in cooperation with local municipalities in Japan. In recent years, the number of local governments in Japan working on international intercity cooperation has increased. Kitakyushu’s pioneering efforts offer a great opportunity for them to learn from the city’s experience and leadership. In addition, by making full use of the strengths of each region, it is possible to provide optimal content to meet the needs of cooperating cities overseas that also complement each other, which will increase opportunities for local expansion of overseas affiliates in each region. Furthermore, ripple effects such as the business expansion of local companies and the creation of more opportunities for businesses with international experience can also be expected.

The second recommendation focuses on cooperation with international students and trainees affiliated with educational institutions such as universities and vocational schools in Kitakyushu. In the past, few international students have been engaged in intercity cooperation, however, once they are involved in projects, their understanding of intercity cooperation in Kitakyushu will be enhanced and form deep ties to the area, which may lead to these highly-skilled human resources setting down roots in Kitakyushu. Even if these human resources return to their home countries, they may continue to support Kitakyushu by disseminating the city’s efforts to local areas.

The third recommendation sees the development of more integrated cooperation by incorporating social aspects into environmental and economic aspects. Kitakyushu City has been promoting the SDGs from very early stages and has been recognized for these efforts both in and outside of Japan. For example, Kitakyushu received the SDGs partnership award at the Japan SDGs Awards from the Japanese government in December 2017, was selected by OECD in April 2018 as the first Asian World Model City for promoting the SDGs, and launched the world’s first urban version of the SDGs in its report on “Kitakyushu City the SDGs Report 2018”⁴ at the United Nations High-Level Political Forum held in New York in the United States in July 2018. The city has already gained experience in advancing efforts with a high affinity with the SDGs, such as the experience of overcoming pollution through partnerships that go beyond the boundaries of civic society, private sector, NGOs, universities and administrative agencies, and discussions by citizens and companies, as well as its experience in formulating the Grand Design of the World Capital of Sustainable Development, which aims at creating a balance between the environment, economy and society, as well as finding the answer to the meaning of “true wealth”.

Kitakyushu is currently facing social issues such as a falling population, declining birth rate and aging society, all commonly observed phenomena in Japanese cities. Therefore, the city hopes to take measures to convert this crunch time into an opportunity using its “Kitakyushu-ism”, and systematize the knowledge and technology developed in the process to boldly take on challenges as a driving force to increase sustainability in Asian cities, where similar challenges await in the wings.

4 Kitakyushu City & Institute for Global Environmental Strategies “Kitakyushu City: the Sustainable Development Goals Report—Fostering a trusted Green Growth City with true wealth and prosperity, contributing to the world—2018” July 2018

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Actions for a Sustainable Society

Collaboration between Asia and the City of Kitakyushu

July 2018

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The Institute for Global Environmental Strategies (IGES) is an international research institute conducting practical and innovative research for realising sustainable development in the Asia-Pacific region. The contents of this publication are the opinions of the authors and do not reflect the views of IGES.

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