Data Collection Survey for Collaboration with International Cooperation and Business by the Japanese Municipality for Comprehensive Urban Development in Developing Countries (Yokohama City)

Final Report

January 2014

JAPAN INTERNATIONAL COOPERATION AGENCY

ALMEC Corporation
PricewaterhouseCoopers Co., Ltd.
NJS Consultants Co., Ltd.

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Abbreviations

3R	Reduce Reuse Recycle
ADB	Asian Development Bank
APBN	*Anggaran Pendapatan dan Belanja Negara*
API	Air Pollution Index
ASEAN	Association of South-East Asian Nations
AUSAID	Australian Agency for International Development
B to B	Business to Business
BAPEDALDA	-
BAPPEDA	*R*egional Body for Planning and Development *(Badan Perencana Pembangunan DaerahIndonesian)*
BAPPENAS	National Development Planning Board *(Badan Perencanaan Pembangunan Nasional)*
BAU	Business As Usual
BEMS	Building Energy Management System
BOD	Biochemical Oxygen Demand
BPLHD	*Badan Pengelolaan Lingkungan Hidup Daerah*
BRT	Bus Rapid Transit
CASBEE	Comprehensive Assessment System for Built Environment Efficiency
CBD	Central Business District
CDM	Clean Development Mechanism
CEMS	Community Energy Management System
CFEZ	Central Focal Economic Zone
CFG	Container Freight Station
CIS	Customs Intelligence Database System
CITYNET	The Regional Network of Local Authorities for the Management of Human Settlements
COD	Chemical Oxygen Demand
COP	Conference of Parties
CSR	Corporate Social Responsibility
DaCRISS	The Study on Integrated Development Strategy for Danang City and Its Neighboring Area
DAK	*Dana Alokasi Khusus*
DARD	Department of Agriculture and Rural Development
DAWACO	Da Nang Water Supply Company
DK	*Dinas Kebersihan*
DKI	*Propinsi Daerah Khusus Ibukota Jakarta*
DOC	Department of Construction
DOFA	Department of Foreign Affairs
DONRE	Department of Natural Resource and Environment
DOT	Department of Transport
DPC	Da Nang City People's Committee
DPU	-
DR	Demand Response
DSM	Demand Side Management

DWSC	Danang City Drinking Water Company
DWT	Dead Weight Tonnage
EMS	Energy Management System
EPC	Engineering, Procurement and Construction
ERP	Electronic Road Pricing
ESCO	Energy Service Company
FDI	Foreign Direct Investment
FS	Feasibility Study
G to G	Government to Government
G30	-
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GMS	Greater Mekong Sub-region
GRDP	Gross Regional Domestic Product
GWRA	Global Water Recycling and Reuse System Association
HAIDEP	The Comprehensive Urban Development Programme in Hanoi Capital City
HEMS	Home Energy Management System
HIDA	The Overseas Human Resources and Industry Development Association
HIS	Household Interview Survey
ICTSI	International Container Terminal Service
IDEC	Industrial Development Corporation
IDR	Indonesian Rupiah
IE Singapore	International Enterprise Singapore
IGES	Institute for Global Environmental Strategies
IMAP	International Marketing Activities Program
IPC	Investment Promotion Center
ITS	Intelligent Transport Systems
JABODETABEK	-
JBIC	Japan Bank for International Cooperation
JCM	Joint Crediting Mechanism
JETRO	Japan External Trade Organization
JICA	Japan International Cooperation Agency
JTA	JABODETABEK Transport Authority
JUTPI	JABODETABEK Urban Transport Policy Integration
KIMA	*PT. Kawasan Industri Makassar*
KITA	Kitakyushu International Techno-cooperative Association
KTI	Kitakyushu Trade Investment One-stop Service Center
LEAD	Local Enterprise and Association Development
LPG	Liquefied Petroleum Gas
M&A	Merger and Acquisition
MICE	Meeting, Incentive (travel), Convention, Exhibition/ Event
MM	Minutes of Meetings
MMDCB	Mamminasata Metropolitan Development Cooperation Board
MOD	Ministry of Defense
MOT	Ministry of Transport
MOU	Minutes of Understanding

MPA	Jakarta Metropolitan Special Area And Investment Promotion
MRT	Mass Rapid Transit
MTS	Makassar Terminal Service
NACCS	Nippon Automated Cargo and Port Consolidated System
NEDO	New Energy and Industrial Technology Development Organization
NGO	Non-Governmental Organization
NO2	Nitrogen Dioxide
NPO	Non-Profit Organization
NRW	Non-Revenue Water
O&M	Operation and Management
OBDI	Overseas Business Development Initiative
OCDI	Overseas Coastal Area Development Institute of Japan
OJT	On the Job Training
PD Pal Jaya	Wastewater Management Enterprise, City of Jakarta
PDAM	*Perusahaan Daerah Air Minum*
PELINDO IV	–
PFI	Private Finance Initiative
PIIP	Priority Infrastructure Investment Program
PMU	Project Management Unit
PPP	Public Private Partnership
PQ	Pre-Qualification
PU	*Departmen Pekerjaan Umum*
RAN-GRK	National Action Plan for Reducing Greenhouse Gas Emission
RPUM	-
RT	*Rukun Tatungaa*
RTG	Rubber Tierd Gantry crane
RW	*Rukun Warga*
SAPROF	Special Assistance for Project Formation
SEA	Strategic Environmental Assessment
SEDP	Socio-Economic Development Plan
SO2	Sulfur Dioxide
SWM	Solid Waste Management
TEU	Twenty-foot Equivalent Units
TICAD	Tokyo International Conference on African Development
TMDC	Da Nang Transport Management and. Drainage Company
TPA	*Tempat Pemunagan Akhirnya*
TPS	*Tempat Pembuangan Akhir*
TSP	Total Suspended Particles
UFW	Unaccounted-For-Water
UNDP	United Nations Development Programme
UPTD	Technical Implementing Unit of Agency
UR	Urban Renaissance
URENCO	Urban Environment Company
USP	Utility Service Program
VCCI	Vietnam Chamber of Commerce and Industry
VINALINES	-

VINAMARINE	-
VND	Vietnam Dong
WB	World Bank
WTP	Water Treatment Plant
WWTP	Wastewater Treatment Plant
Y-PORT	Yokohama Partnership of Resources and Technologies
YSCP	Yokohama Smart City Project

1. Introduction

(1) Background and Objectives

1.1 Developing countries of Asia have faced various urban problems such as insufficient urban infrastructure, worsening urban environment and expansion of urban poor because of rapid economic development and concentration of population, so sustainable urban development is an urgent issue. To solve these urban issues, needs from developing countries for technologies, know-how and human resources of Japanese Municipalities for urban planning and development, and many Japanese Municipalities have promoted international cooperation projects for local governments of developing countries.

1.2 Among them, Yokohama City is one of major municipalities to promote various international cooperation and business support activities of local private sectors for developing countries utilizing experiences and know-how of urban planning and development, especially six (6) major projects[1] started from 1965. Yokohama City has promoted to attract international conferences and events as an international city with Yokohama Port, and experiences to promote various international cooperation projects including cooperation with JICA such as organizing TICAD IV, dispatching Japanese experts for JICA technical assistance projects, implementation of training programs. Based on these experiences of international cooperation activities, Yokohama City concluded an agreement of comprehensive cooperation with JICA in 2011. Furthermore, Yokohama City has promoted "Y-PORT project for international deployment of technology through Public-Private Partnership (PPP)" to contribute development of developing countries, especially to cooperate for urban development of Asian mega cities.

1.3 Yokohama City is selected as a model, this project aims to study experiences, know-how of local government and technologies of local private sectors of "comprehensive urban development" which can contribute to sustainable urban development of Asian mega cities (Indonesia and Vietnam are the target countries of this project), and to propose potentials and orientations for international cooperation and Public- Private Partnership based on collaboration with Japanese Municipalities.

1.4 Furthermore, in the process of the project, pamphlets, project profiles and video were developed to promote experiences of and lessons learned from Yokohama City to developing cities effectively.

(2) Coverage

1.5 Target areas are Jakarta City and Makassar City of Indonesia, Danang City of Vietnam and Yokohama City of Japan.

1.6 In this project, four (4) major sectors of "urban planning and urban development", "water and sewerage", "environmental management" and "port development and management" are covered, and experiences, know-how and technologies of these target sectors are elaborated and promotion measures for developing countries are proposed.

[1] "strengthening of CBD project", "Kanazawa Chisaki land fill project", "Kohoku New Town development project", "Highway network construction project", "Rapid railway construction project" and "Bay Bridge construction project"

Figure 1.1 Target Areas of the Project

Location of Target Areas

Da Nang City of Vietnam

DKI Jakarta of Indonesia

Makassar City of Indonesia

Source: JICA Study Team

(3) Project Approach

1) Basic Principles of Project Implementation

1.7 In this project, it is expected to contribute to solve urban issues of developing countries by way of application of various experiences, know-how and technologies of Yokohama City, and to identify potentials and measures to promote sustainable development of developing countries through identifying new business opportunities of public and private sectors of Yokohama City and promote technical cooperation and businesses. Furthermore, it is expected that Yokohama City will fulfill an international responsibility as a developed city, and realize an international cooperation which is the policy of the city.

(a) It is required to promote urban development including environmental infrastructure development for Asian developing countries where urban environment have been worsened because of rapid economic development and increase of urban population.

(b) To tackle with these urban issues of developing countries, Yokohama City has implemented various international cooperation activities by cooperating with JICA. While infrastructure development project, technical assistance, dispatching of experts, and implementation of training programs for individual organization, have been implemented individually, comprehensive approaches to cover whole urban issues are not enough.

(c) To promote a comprehensive urban development approach including smart city, it will be possible to promote efficient and effective development with technical support for area-wide development including urban infrastructure including know-how of urban management.

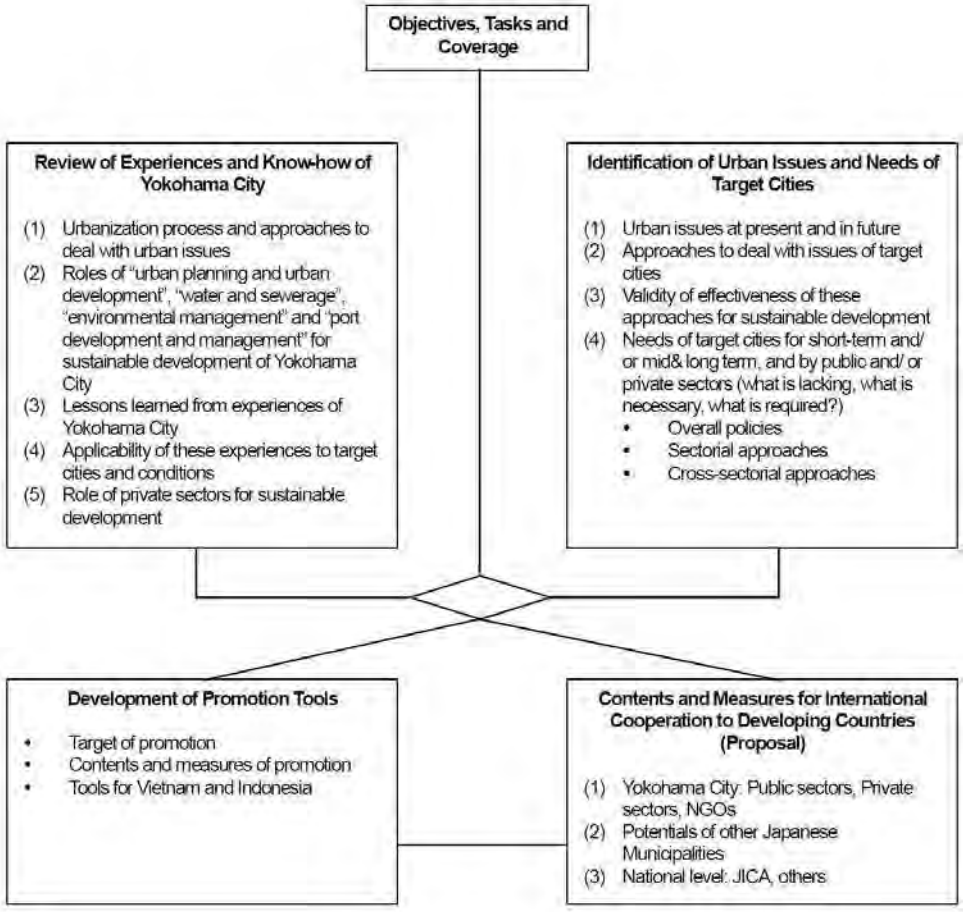
(d) Experiences and know-how of comprehensive urban development will be realized if local government and private sectors collaborate with. For enhancement of potential of technical cooperation and business promotion by Japanese Municipalities and private sectors, it is necessary to take into consideration of overall urban infrastructure of city including not only individual infrastructure facility development but also service improvement of operation, management and maintenance.

(e) Yokohama City has experiences of exchange programs for technical cooperation to developing countries, and high technical capabilities of port, water and solid waste management sectors. Toward future promotion of technical cooperation by other Japanese Municipalities, it will be an important trigger to elaborate experiences and know-how of urban development of the local government and private sectors in Yokohama City and to identify potentials and orientations for technical cooperation and public- private partnership by Japanese Municipalities.

To achieve objectives and expected outputs mentioned above, it is necessary to understand both sides of: (i) actual condition of urban issues and requirements for improvement of cities in developing countries, and (ii) needs, validity and capacity for application of experiences, know-how and technologies of Yokohama City to cities in developing countries.

1.8 It is a significant message that Yokohama City has been developed based on long years of experiences, which have made various efforts, implemented concrete policies and measures to tackle with urban problems which are similar to developing cities now, and implemented new approaches for future.

Figure 1.2 Basic Approach of the Study



Source: JICA Study Team

2) Promotion Tools

1.9 In this project, pamphlets, project profiles (16 themes) and a movie were developed which compile experiences and know-how of urban development in Yokohama City as city promotion tools, in addition to this report. So far, many departments of City of Yokohama have developed various types of promotion tools which are utilized for JICA trainings, international events, etc. But the promotion tools of this project focused to introduce not only prosperity at present but also issues and constraints of past experiences, which can be shared with developing cities which they have faced.

1.10 These promotion tools were introduced taking opportunities of Asian Smart City Conference in October 2013 which was held at Pacifico Yokohama, and the Final Seminar at Da Nang City in November 2013. Participants appreciated these tools that developing cities and Yokohama City had similar experiences to overcome issues, and could understand Yokohama's approaches that the City struggled to promote urban development with shared vision and strategic projects with partnerships of citizens and private sectors. Furthermore, project profiles which compiles detailed information of each project, aroused interests of some departments and agencies of developing cities to learn more about detail contents and methods to implement projects from Yokohama City. It is expected that these promotion tools will be broadly utilized in many occasions such as international seminars and conferences of Yokohama City, as well as JICA's activities to contribute promotion of city-to-city cooperation.

Table 1.1 Promotion Tools of Experiences of Urban Development of Yokohama City

Promotion Tool	Language	Main Contents
Pamphlet "Building a Global Model of Sustainable City Management" –Case of Yokohama-	English, Vietnamese, Indonesian	1) Urban issues of emerging cities 2) Introduction of Yokohama City 3) 7 Approaches of sustainable urban management 4) International cooperation of Yokohama City
Project Profiles	English, Vietnamese, Indonesian	1) Minato Mirai 21 (MM21) 2) Kohoku New Town 3) Kanazawa Reclamation Project 4) Road Development 5) Railway Network Development 6) Intermodal Transfer Facility Development 7) Pollution Prevention Agreement and Environmental Conservation Agreement 8) Global Warming Countermeasures 9) Yokohama G30 and 3R Dream Plans 10) Waterworks of Yokohama City 11) Sewerage System in Yokohama 12) Port of Yokohama 13) Yokohama Smart City Project (YSCP) 14) Incineration Plant 15) CASBEE Yokohama 16) PACIFICO Yokohama
Movie	English, with subtitles in Japanese, Vietnamese, Indonesian	

Source: JICA Study Team

3) Study Schedule

1.11 This study was conducted from March 2013 to January 2014. Field surveys were conducted in Da Nang City in April and in DKI Jakarta and Makassar City in June 2013 to collect information and data and to discuss with stakeholders.

Table 1.2 Outline of Study Schedule

Period	Field Survey	Domestic Work
April to May 2013	Survey in Da Nang City in Vietnam	
May to June 2013		Review of experiences of Yokohama City and analysis of target developing cities
June to July 2013	Survey in DKI Jakarta and Makassar City in Indonesia	
July to November 2013		Preparation of report, preparation of promotion tools (Smart City Week on 21 to 25 October at Pacifico Yokohama)
November 2013	Seminar in Da Nang City (20th Nov)	
December to January 2014		Finalization of report

Source: JICA Study Team

Table 1.3 List of Interviews and Meetings

City	Date	Interview and Meeting
Da Nang City	8 April	Da Nang Investment Promotion Center (IPC)
		Da Nang Port
	9 April	**Da Nang Seminar**
	11 April	VCCI Da Nang
	16 April	U&A Design
	17 April	Sewerage company
		JETRO Hanoi [1)]
	18 April	Recycling companies
	19 April	IBC Vietnam [1)]
	20 April	Mr. Otsu, JICA port expert [1)]
	22 April	Japanese shipping company [1)]
		VINALINES[1)]
		VINAMARINE[1)]
	23 April	DAWACO
		Department of Construction (DOC)
		Department of Natural Resource and Environment (DONRE)
		Japanese company (user of Da Nang Port)
		Vietnamese logistic company
	24 April	URENCO
		International shipping companies
	25 April	Logitem Vietnam Da Nang Office
		Japanese company (user of Da Nang Port)
	26 April	Department of Transport (DOT)
		Department of Planning and Investment (DPI)
Makassar City	24 June	Spatial Planning Agency of South Surawesi
	25 June	South Sulawesi Provincial Infrastructure Division
	27 June	**Joint Meeting with Maminasata Metropolitan Area and Makassar City**
		Mr. Inaba, JICA Program Office in Makassar City
	28 June	**Mayor of Makassar City**
		Mr. Higashimoto, Representative of Consutate of Japan
	29 June	Consultant team of the project for Maminasata Regional Urban Waste Management Project in Indonesia
	1 July	BAPPEDA Ms. Rafaidah, Port sector

		Transport Agency Province Mr. Sudiyanto, port sector
		International shipping companies
	2 July	PELINDO IV
		Local shipping company
DKI Jakarta	18 June	PD Pal Jaya
	19 June	BAPPEDA
	24 June	JICA Indonesia Office
	25 June	Mr. Andono , DKI Environment Management Board
	1 July	Mr. Rudy, DKI Public Works Agency
		Mr. Sulis, Assistant Deputy Governor, DKI Governor's Office, Transport Division,
	2 July	DKI Department of Environment
		Mr. Hasan Basri, Asst. of Economic Affairs, Regional Secretary of DKI Jakarta
		Mr. Yano, JICA expert for Ministry of Energy and Mineral Resources
	3 July	**BAPPENAS**
		Mr. Kawanishi, JICA expert for climate change project
	4 July	Green Building Council Indonesia
		Mr. Hidayat Mao, port consultant
		Mr. Sasaki, JICA expert for Ministry of Transport
	7 月 5 日	DKI Dept. of Industry and Energy
		Energy Management Indonesia
		Ms.Fitri, DKI Department of Environment
Japan		Yokohama Port Corporation
	17 April	JETRO Yokohama
	10 May	Cluise operation company
	June	Private companies in charge of low corbon sector
	23 Oct	Small and medium enterprises in charge of water, sewerage and solid waste management

1) Interiew in Hanoi City
Source: JICA Study Team

2 Experiences and Outcomes of Yokohama City

(1) History of Urban Development of Yokohama City

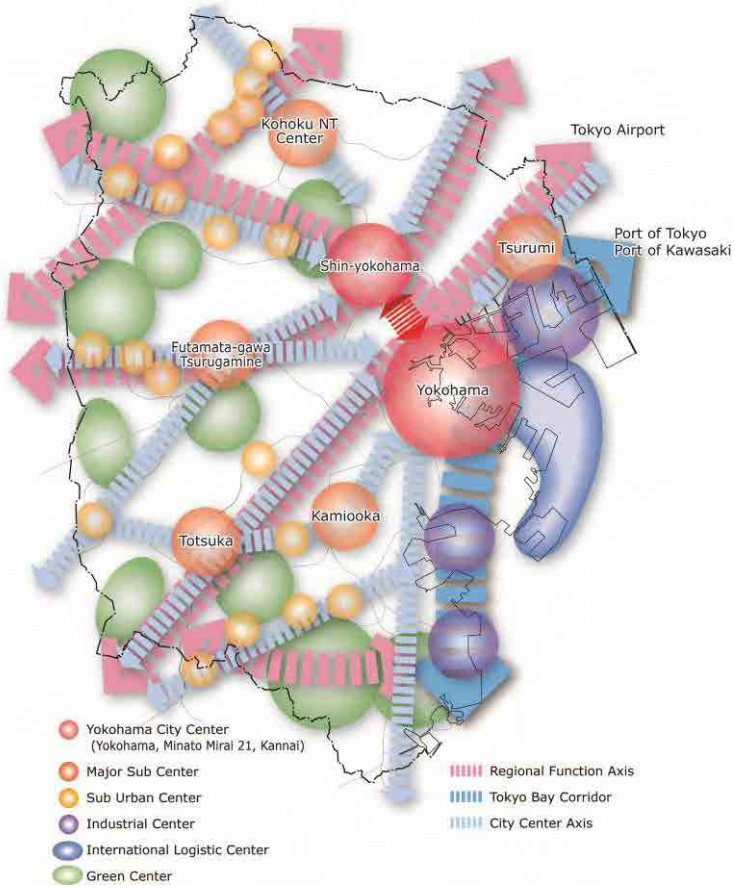
1) General Introduction of Yokohama City

2.1 Yokohama is the second largest city in Japan, home to a population of 3.7 million people. Today, Yokohama is one of the prime international ports in Japan and has long led the country's development in heavy industry. Simultaneously, the city has become one of the most livable cities in the world and is well known in Japan as a popular place for people to live because of its high-standard living environment and good accessibility to Tokyo, as well as between the city center and its residential suburbs.

2.2 Yokohama is a chosen destination for tourism by both local and foreign tourists due to its rich history, vibrant culture, and the availability of various entertainment facilities. There is a long way to go, however, to be an internationally competitive and livable city.

Figure 2.1 Location of Yokohama City

Figure 2.2 Urban Structure of Yokohama City



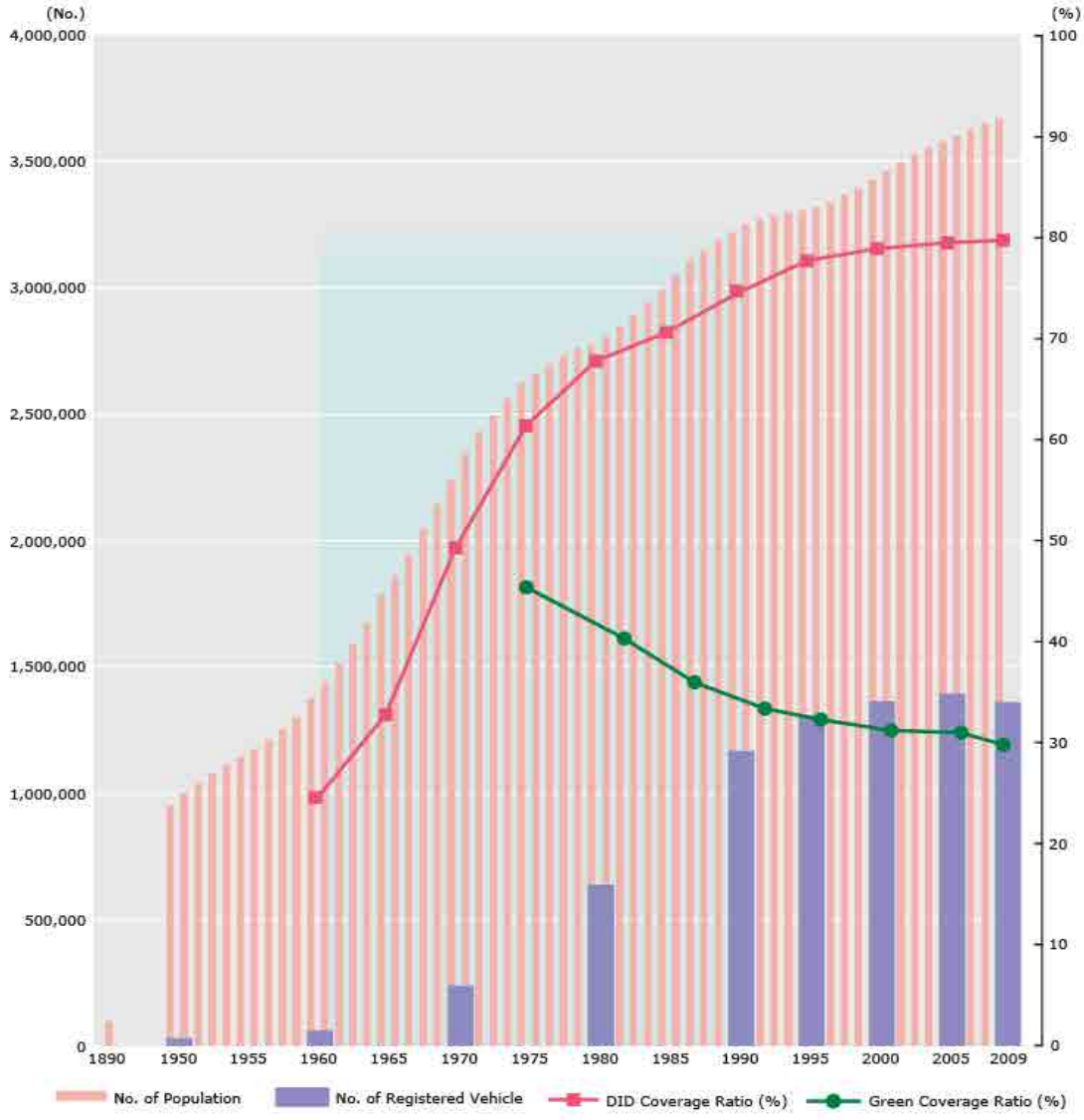
Source: JICA Study Team

Table 2.1 Main Indicators of Yokohama City

Indicator	Data
Population	3.69 million (2011)
Population density	8,491 person/ km^2 (2011)
% of Pop. over 65	19.6 % (2009)
Land area	434.98 km^2 (2010)
Green space ratio	29.8% (2009)
Gross City Product	12.77 trillion JPY (2008)
Citizen income	3.101 million JPY/ capita (2008)
% of Public Transport	42.7% (2008)
Registered Vehicles	1.3 million, 0.84/ household
GHG emission	5.18 ton/ capita (2009)
No. of Tourists	24.8 million (2012)
No. of MICE Events [1)]	47 (2010)
Livable City Ranking [2)]	1st Rank (2011, 2012)

1) Medium to large scale international events (more than 300 participants of which over 50 are foreigners)
2) SBI Life Living
Source: JICA Study Team

Figure 2.3 Population, Registered Vehicle, DID Coverage Ratio and Green Coverage Ratio



Source: JICA Study Team

(2) Approaches to Sustainable Urban Development

1) General

2.3 Yokohama's experience, or the approaches we took to achieve sustainable growth, can offer a new perspective for city leaders and urban practitioners and planners around the world. Similar to what emerging cities in the world face nowadays, Yokohama also experienced significant urban issues from the 1960s through the 1980s, when strong economic growth took place and the population dramatically increased in the city.

2.4 The City Government, which complies with requests and demands of citizens directly, must formulate plans with a long-term perspective. In 1965 when Yokohama City had faced various urban issues, Yokohama' s goal to be the "International Cultural Management City" was formulated, which integrated the historical development background of a port city, an industrial city and a residential city.

2.5 In order to cope with the issues, Yokohama introduced various development projects and regulative measures, each of which were designed to ensure integration with each other, consistent, long-term implementation, as well as active participation of citizens and private sectors. By calling for collaboration with the National Government, private sectors and citizens for planning and implementation, Yokohama City has provided public services and facilities to attain policies and targets for urban development. Yokohama today forges ahead with continuous innovations and experiments to cope with the new urban challenges.

2.6 The experiences of challenges to urban issues can be shared with other cities around the world for sustainable development. Yokohama's experience, or the 7approaches we took to achieve the sustainable growth, can bring a new perspective for city leaders and urban practitioners and planners around the world.

1) Building basic urban structure through integration of strategic projects
2) Urban development management through regulations and guideline
3) Enhancing the attractiveness of the city through urban design and town management
4) Private sector and citizen's participation
5) Building a resilient city through comprehensive disaster prevention
6) Providing 24-hour lifeline for all citizens
7) Continuous innovations

Figure 2.4 Yokohama's Goal

Figure 2.5 Examples of Target Benchmarks of Urban Development

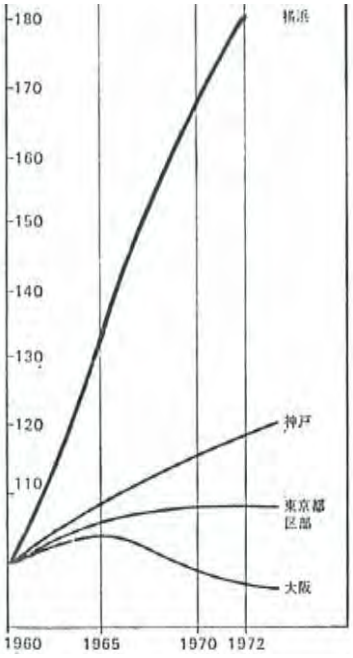
- 6 Strategic Projects for strategic infrastructure development
- 190,000 employment in Minato Mirai 21
- 300,000 population of 2,500ha in Kohoku New Town
- 30% waste reduction target of G30 Plan
- 15 minutes accessible from home to nearest station
- Less than 30 minutes accessible to urban center
- 100% service coverage of sewerage system
- Zero children on waiting list for child care nursery services

Source: JICA Study Team based on "Urban Development of Yokohama", General Affairs Bureau, 1965

2) Building Basic Urban Structure through Integration of Strategic Projects

Background of General Plan Formulation

Figure 2.6 Population Increase Rate of Major Cities (1960=100)



Source: "Yokohama, Practical Method of Urban Planning", Kashima Publishing

2.7 High-growth period of the 1960s and 1970s, Yokohama faced serious urban problems which were interrelated and complex. Rapid economic development of Tokyo caused a rapid housing development and sprawl to neighboring suburbs, including Yokohama. Population growth rate of Yokohama during this period stood at 5-10% per year, even compared to the big cities Tokyo, Osaka, and Kobe, which was higher than any other city. Lack of services and urban infrastructure, traffic congestion, environmental pollution, and social services lack, rapid urbanization caused "five major battles" including issues of solid waste, road traffic, environmental destruction, water resources, and public lands.

2.8 In addition, it required a large amount of government spending is for urban development, but the financial basis of was local government was insufficient, which was so-called 30% of self-government, and 10% of self-government. As a result, the local budget to provide city services and facilities to meet the burgeoning demand was limited.

2.9 During a high-growth period, in each municipality, comprehensive plan to capture the vision of the future and solutions to deal with problems of urban development became necessary for each municipality. Yokohama developed a comprehensive plan in 1965. In addition, the responsibility of formulating the basic policy was defined in the local government in the Local Government Act amendment in 1969. Yokohama City formulated the Basic Concept for the City of Yokohama in 1973 in response to this, and medium-term and long-term comprehensive plans formulated thereafter. It was decided to analyze the cross-sectional and overall the whole city by These concepts and plans indicated the direction of the future, to give an opportunity for comprehensive understanding of the parties concerned.

2.10 これらの総合計画の具体的な特徴は次の通りである。i)単にフィジカルな事業だけでなく、福祉や文化面の要素を織り込んだこと、ii)プロジェクト、コントロール、アーバンデザイン等の内容を盛り込んで実践的都市づくりを確認する役割を果たしたこと、iii)5 大戦争に代表される都市問題に対して具体的な対応を図ったこと、iv)市の財政との関連性を強め、毎年度予算編成とのリンクを強めることで、市内部での計画性を現実的なものとしたこと、v)計画について議会や審議会、市民とも討議できる機会を与え、計画が市民との交流をもち、市民的な計画とする努力がなされたこと。しかし一方で現実的には縦割り行政の力が強く、財源や権限の限られた自治体では、総合計画に示された長期的な都市構造を実現することは非常に困難であった。

2.11 Specific features of the comprehensive plans are as follows: i) to incorporate not only physical projects but also cultural and welfare aspects, ii) to play a role to explore feasibility of urban development including aspects of projects, control, urban design, etc., iii) to identify concrete actions against urban problems represented by the five major battles, iv) to strengthen the association between city finance and link with annual

budgeting for implementation, v) to provide opportunities to discuss with Council and citizens, planning in the city section be given the opportunity for discussing the Council, Committee and citizens with interaction. On the other hand, the power of the vertical administrative structure of the city government was strong in practice, so it was difficult to materialize a long-term urban structure only with limited power of authority and financial resources.

Strategic Project-Based Approach

2.12 Yokohama in the 1960s and 1970s, during which strong economic growth took place in Japan, faced serious urban issues, which were correlated with each other intricately. Rapid economic development in Tokyo resulted in urban sprawl and land development of neighboring suburban areas including Yokohama City. Population growth in this period was 5-10% per year, which was much higher than other metropolitan areas in Japan at the time.

2.13 This rapid urbanization caused a lack of urban infrastructure and services, traffic congestion, pollution and insufficient social services, etc. Furthermore, the local budget was limited in providing sufficient urban services and facilities to meet increasing demand.

2.14 Yokohama City decided to solve these issues drastically by implementing strategic basic infrastructure projects, which would formulate a massive urban structure, which was similar to the backbones and organs of people. “6 Strategic Projects”, composed of 3 urban development and 3 transport development projects, were elaborated projects that were closely linked to each other and had synergistic effects.

2.15 Furthermore, the comprehensive project implementation process called for involvement of various stakeholders, not only city government but also national government, the private sector and citizens. A shared vision and clear project images mobilized and vitalized these stakeholders to work together for implementation.

2.16 These major projects required a large amount of funding, which Yokohama City alone had no way to cover on its own. Instead, Yokohama chose to share the financial burden with other stakeholders, such as the national government and the private sector.

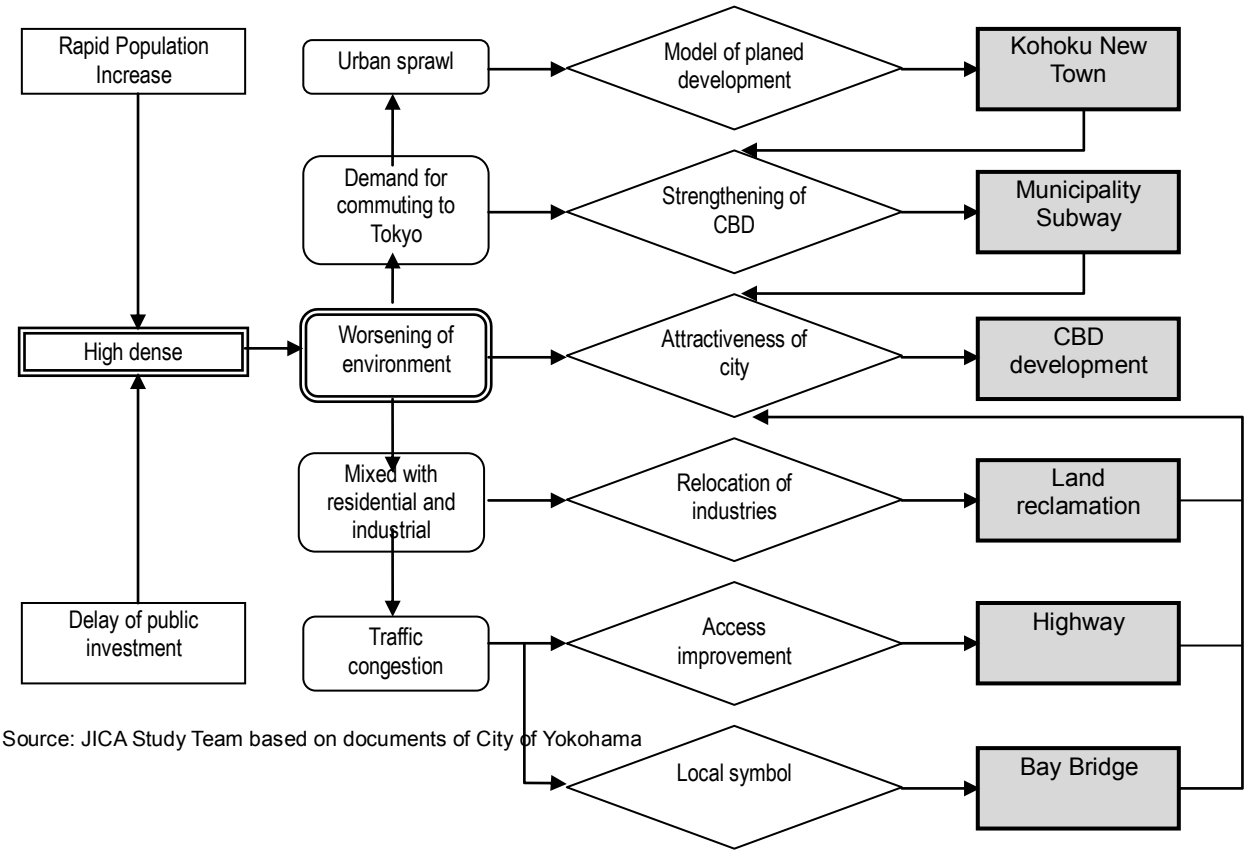
2.17 Yokohama’s proactive proposals successfully pushed the national government to implement the proposed projects by using the national budget, which was a pioneering case for city governance in those days.

2.18 Yokohama also facilitated private investment by establishing partnerships with private developers and encouraging their participation in the projects. The city issued both domestic and foreign currency bonds that were guaranteed by the national government.

Synergy Effects and Integrated Projects

2.19 The six projects are originally integrated, supporting and enhancing the functions of each other. Such large-scaled, mutually connected projects were essential in establishing the foundation for the development of the city as a core economic center as well as a comfortable, livable city for the entire citizenry.

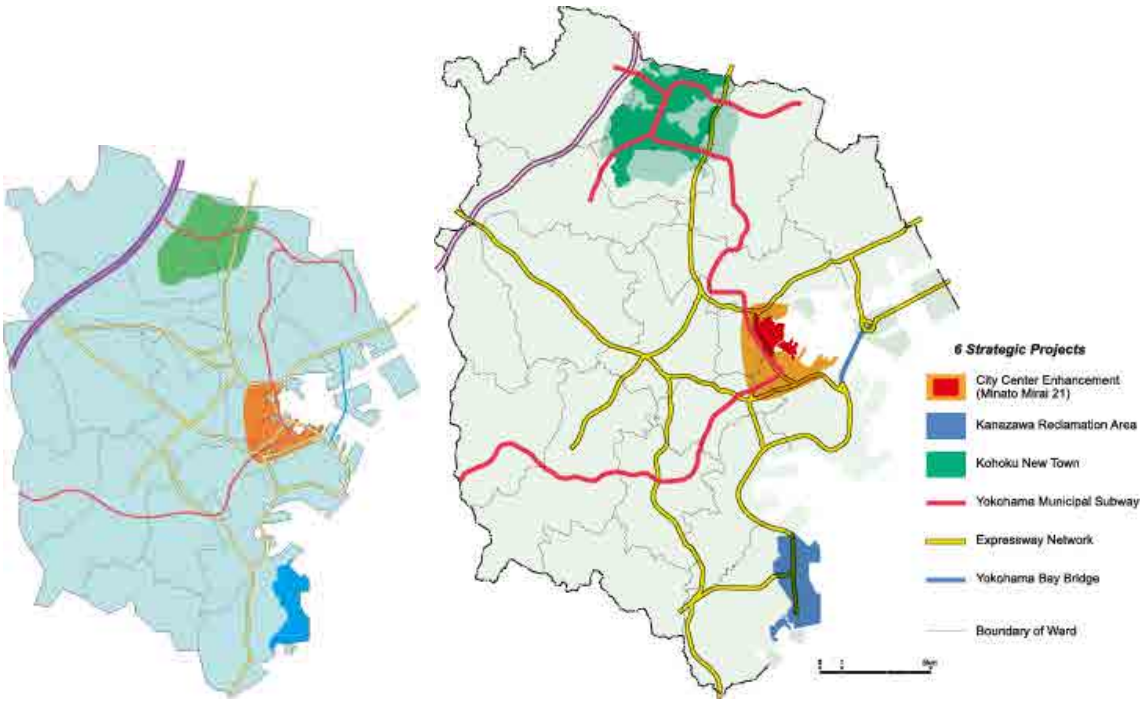
Figure 2.7 Approaches to Urban Issues and Relationship with 6 Major Projects



Source: JICA Study Team based on documents of City of Yokohama

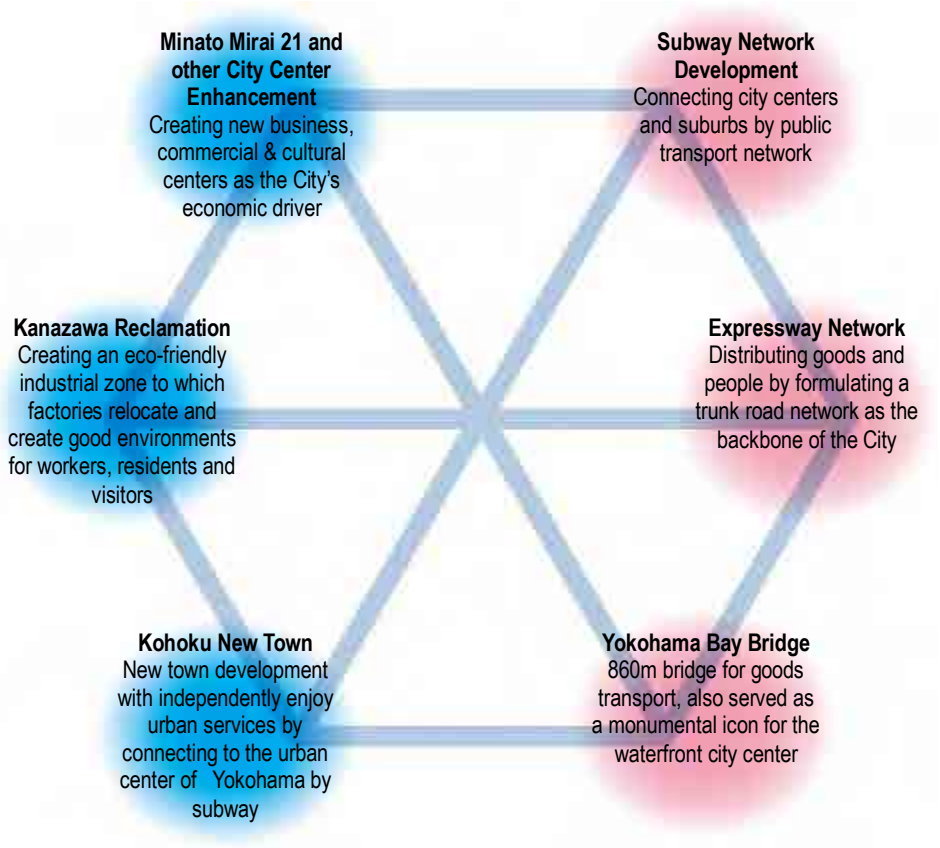
Figure 2.8 The 6 Strategic Projects

Original Plan **Present**



Source: JICA Study Team

Figure 2.9 Elements of The 6 Strategic Projects



Source: JICA Study Team

Area Developments for Improving Economic Functions & Livable Environment

2.20 1) "Minato Mirai 21 (MM21 or Future Port for 21st Century) Project", the waterfront rejuvenation project , created a revitalized business and cultural center in the waterfront zone, which is today attracting a number of global firm offices, shops, museums, MICE events, and tourists from around the world.

2.21 City center enhancement projects including MM21 were aimed at strengthening the economic function of the city, in order to transform itself from a mere bedroom town for commuters to Tokyo into a new economic center that provides employment opportunities, investment attractions, and entertainments.

2.22 To create employment in the City, half the number of commuters to Tokyo at the time was set as the target number of employment in MM21 (190,000 people).

2.23 However, so much land in Yokohama City including this waterfront zone used to be dominated by heavy industries and factories in the 1960s. In order to implement the city center enhancement projects, the city conducted the 2) "Kanazawa Reclamation Project", the 660 ha land reclamation project that provided a designated industrial zone with highly environmental- conscious designs with wastewater treatment facilities and preserved greeneries.

2.24 Private heavy industrial companies decided to relocate to this area, by utilizing vacant land for urban redevelopment projects of MM21. In addition, factories that used to be scattered around the city were encouraged to relocate to this new area.

2.25 The City worked on the negotiations with some of the private operators for the relocation. Their relocation improved the overall environment of the city and also created much vacant land, which was utilized for city center enhancement projects and/or creating more public facilities.

2.26 3) “Kohoku New Town Project” was developed as a planned residential area with commercial centers, public facilities and agricultural land, and is today accommodating many commuters to the new city centers mentioned above. The new town was designed to provide a comfortable living environment while restraining the trend of disorganized, environmentally destructive construction of housing around the city. The new town offers green zones, parks, and hillside open spaces, designed to create a beautiful, livable environment for all residents.

Access Developments for Enhancing Mobility

2.27 In order to improve accessibility for these new areas and to solve traffic congestion, transport networks of 4) “subway development” and 5) “expressway development” were also implemented.

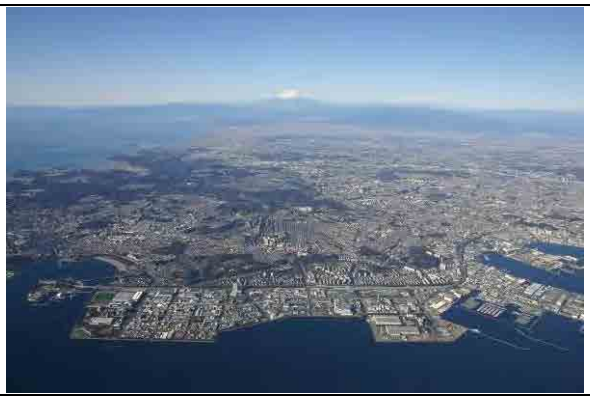
2.28 The subway network of the City was formulated to provide public transportation services to those inconvenient areas such as build-up downtown and untouched suburbs where other railway companies didn’t operate nor had a plan to provide services.

2.29 As a result Municipal City Subway provided a good access for downtown areas and newly developed area such as Kohoku New Town to the city center of Yokohama.

2.30 Expressways were also developed. The new expressways were designed to segregate the roads for local and medium-/long-distance travel to enhance mobility of people and goods both within and around the city. Though it was originally planned to develop an elevated expressway in the city center, the City discussed with the National Government and finally decided to develop an underground expressway to preserve the landscape and commercial functions of the city center. This is one of the experiences which the City developed transport infrastructure from viewpoint not only of traffic functions but also of overall urban development.

2.31 The City also accomplished the construction of an 6) 860 m “Yokohama Bay Bridge” in the Port of Yokohama, mainly designed for goods transport by heavy trucks as a direct route between the port and industrial area in the City and the Tokyo area. The segregation of cargo traffic helped reduce congestion within the city, and the bridge became a new monumental icon for the waterfront area.

Figure 2.10 Photos of the 6 Strategic Projects

1) City Center Enhancement Project (Minato Mirai 21)	2) Kanazawa Reclamation Project
	
3) Kohoku New Town Project	4) Subway Network Development Project
	
5) Expressway Network Project	6) Yokohama Bay Bridge Project
	

Source: City of Yokohama (1,2,3,4,5), Mizuho Kuwata (6)

3) Growth management of Yokohama through Regulations and Guidance

Effective Urban Management

2.32 Population increase rate of Yokohama City was the highest among major cities in Japan, and urban sprawl, lack of schools, parks and sewerages caused financial burdens on city budget.

2.33 To solve these issues, the City initiated to manage urban development with a strong leadership, by utilizing national laws and developing city's original ordinance and guidance system, which were called "Yokohama method" to develop a comfortable living environment.

Principles of "Yokohama Method"

2.34 For comprehensive approach to urban development, a holistic urban management including survey, planning, implementation and management was established as "Yokohama Method", in addition to a legal system.

- To analyze urban issues comprehensively
- To develop strategies to solve issues
- To set targets which the City should take initiatives
- To review existing legal and institutional framework
- To implement necessary policies and measures
- To create new systems
- To propose necessary improvements of systems to the National Government

Regulation and Guidance

2.35 Yokohama City controlled pressures of urban development by getting the most out of national urban planning systems.

2.36 To protect natural environment and to save public investment for infrastructure development, the City limited urbanization promotion area as minimum and deliberately set relatively large portion as urbanization control area. Boundaries between urbanization promotion and control areas were set in detail respecting contour and other natural conditions. To control development pace, areas categorized as urbanization control areas were gradually converted to urbanization promotion areas as necessary.

2.37 Furthermore among urbanization promotion areas large part were set as low density residential zones to avoid high urban pressure on infrastructure due to population concentration and high density.

2.38 The City publicly announced original ordinances and guidelines to regulate and guide local government as well as private developers for appropriate urban development.

Urban Growth Boundary based on Urban Planning System in Japan

2.39 To avoid urban sprawl, development permit system was legislated to set the urban growth boundary in the amended Urban Planning Act in 1968. This boundary is to divide urbanization promotion area where development is promoted within 10years and urbanization control area where development is prohibited.

2.40 In urbanization promotion area, zoning is set to regulate land use. In case of Yokohama City, 1/4 of entire city area is designated as urbanization control areas to preserve green areas.

General Guideline on Housing Land Developments

2.41 While it was necessary to provide public services and facilities such as schools and parks to meet demands of increasing population by housing development, these urban facilities were not developed enough till 1965, and the Cities would face financial collapse if no actions were taken.

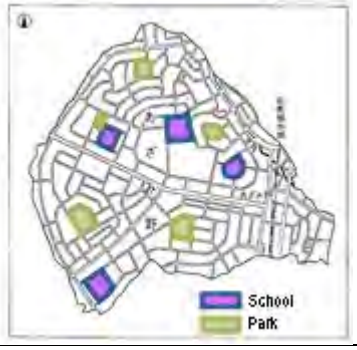
2.42 To request developers of large-scale urban development for providing public lands of schools, roads, parks, waterworks, etc. "General Guideline on Housing Land Developments" was formulated in 1968. This guideline was a planning standard which

Yokohama City applied to appraise development plans by developers.

2.43 Based on the guideline, plans of public facilities which were not designated under the Urban Planning Act such as schools and parks are appraised, and the City requested developers to share costs of these facilities or to provide public lands for them.

2.44 In sum, Land Formulation Guideline was effectively applied to set rules between the City and developers to secure public facilities and lands and to guide urban development properly to meet planning standards.

Figure 2.11 Land Readjustment Project in Motoishikawa Ohba Area

<table>
<tr><td>Project Name: Land Readjustment Project in Motoishikawa Ohba Area
Period: 1969~1977
Area: 179.7ha
Implementation body: cooperative composed of a developer and land owners of the area
Application of Guideline: cost sharing or land contribution for school, park, road for public use</td><td> 
</td></tr>
<tr><td>Elementary School</td><td>Park</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>District Road</td><td>Residential Road</td></tr>
<tr><td>  </td><td>  </td></tr>
</table>

Source: JICA Study Team

Urban Area Environmental Design System

2.45 To provide incentive to private developers to participate and create better build up urban environment, “Urban Area Environmental Design System” was formulated in 1973.

2.46 Under this system private developers would get bonus in height control and floor area ratio by providing public facilities in private lands such as sidewalks, civic plaza and parking space. Through this method, the City guided and aimed at creating better urban environment with private sector participation.

General Guideline for the Preservation of Scenic Yamate

2.47 The Yamate District, which was a former foreign settlement, was successively developed with condominiums after the postwar derequisition and many Western-style buildings were subsequently lost.

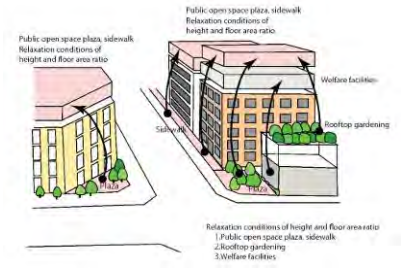
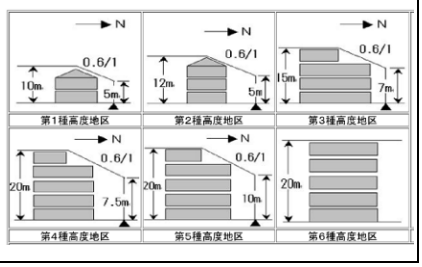
2.48 "General Guidelines for the Preservation of Scenic Yamate" were then adopted in 1972 to preserve the landscape of historic residential/educational districts in the low-rise residential area.

Guideline for Shadow and Height District

2.49 High density and lack of enough spaces between building cause insolation related issues. Especially in residential areas it is required to reduce conflicts and to regulate building heights.

2.50 In addition to the Building Code, Yokohama City designated "Guideline for Shadow" in 1973 to guide building shape and heights to secure adequate sunlight for existing housings. Furthermore, north side slant line was regulated in height district in addition to the national code regulation.

Figure 2.12 Regulations and Guidelines

Urban Area Environmental Design System	Yamate District	Regulation of North Side Slant Line in Height District
		

Source: City of Yokohama

4) Enhancing Attractiveness of the City through Urban Design and Town Management

Urban Design in Yokohama

2.51 Urban design has served not only as a strategy to overcome urban issues but also to balance both convenience/ economic efficiency and humane characteristics of the city such as beauty/ entertainment. Hence urban design has towed the city's movements towards creating a characteristic and attractive urban environment in Yokohama.

2.52 The major objectives for urban design are stipulated in the Urban Design Plan of Yokohama as follows:

(i) Support and create a safe and comfortable pedestrian environment
(ii) Treasure indigenous natural values such as topography and vegetation
(iii) Preserve historical and cultural inheritances
(iv) Increase open space and greenery
(v) Value water space such as the sea and river
(vi) Increase a place for mutual interaction and communication among citizens
(vii) Pursue formational and visual beauty within the city

Various Undertakings of Urban Design

2.53 Central Area: The formation of a Waterfront Axis (see pic 1) in the coastal area of the central urban area and a Green Axis that travels from inland to the sea, which are the main attractions of Yokohama. Unique urban design is also applied to Bashamichi Area (see pic 2) and Motomachi Area (see pic 3), both known as historical old towns in Yokohama.

2.54 Public Area: Major undertakings include Light Up Yokohama (see pic 4) which commenced in 1986 with the purpose of effectively revealing characteristic assets of Yokohama and creating attractive nocturnal urbanscapes, which differ from those of daytime. The Open- Air Cafes (see pic 5) are adopted as part of further deployment of the redevelopment of Nihon-Odori, thanks to the local community's initiative and after repeated social experimentation.

2.55 Community Development Embracing History: The General Guidelines for Community Development that Embraces History involves a system for preserving and using historic buildings with top priority placed on the preservation of their exterior appearance and by encouraging land owners to actively use the insides, thus preserving historic landscapes that are characteristic of Yokohama (see pic 6) . One example includes the preservation of the historic landscape along Nihon-Odori, in which historic buildings were preserved in the lower part of the new architecture with high-rise buildings constructed behind them, so that the historic landscape would be preserved.

Participatory Town Management and Legislative Control

2.56 It is over a quarter of a century since the Minato Mirai 21 project began in 1983. Diversified urban functions to form a high-quality urban area have been created by various stakeholders, including Yokohama City, private sectors, citizens including residents and employees.

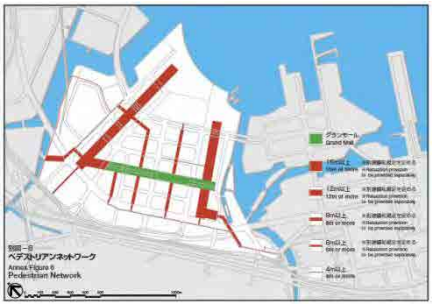
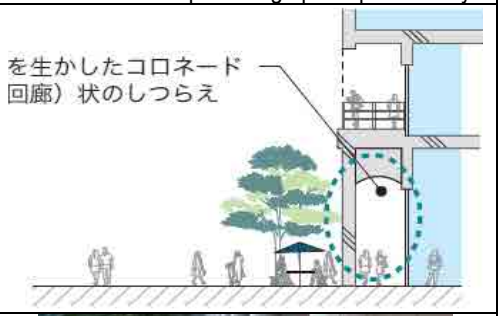
2.57 In 1988, landowners whose estates had precedence over infrastructure development in the Minato Mirai 21 Central District and the Yokohama Minato Mirai 21 Corporation together concluded a "Basic Agreement on Town Development under Minato Mirai 21". This agreement is a guidance to operate the MM21 district in an appropriate manner, while it doesn't have the force of law.

2.58 Some of the articles which must be strictly controlled and regulated are applied for as standards under the following laws with legal basis: District Plan under the Urban Planning Law, Landscape Act, and Landscape Ordinance.

2.59 By combining regulations and guidelines, city, private sector and citizens share a common vision and rules to sustain the MM21 District.

2.60 What is noteworthy is that a spontaneous agreement by landowners existed prior to the application of legal control, which is one of the reasons for the success.

Figure 2.13 Various Areas with Urban Design

Waterfront Axis of Yamashita Park	Bashamichi District	Motomachi District
		
Light Up Yokohama	Open-Air Café	Yokohama City Port Opening Memorial Hall
		
Building Height Control	Pedestrian Network	Creation of Public Space using a part of private facility
		
		

Source: City of Yokohama

5) Private Sector & Citizens' Participation

The People-Driven Development

2.61 Public policies, which affects wide-range of stakeholders or even all citizens, often faces numerous obstacles in the process of their implementation. Even carefully designed policies could fail to be properly enforced and accepted by the public, sometimes due to a lack of public awareness, conflict of interests, and/or lack of human or financial resources in local administration to reinforce these policies. Indeed, many of the emerging cities in today's world are struggling to successfully implement a variety of their new policies, such as pollution control, disaster management, various educational programs, etc., designed to cope with the rapid change of their living environment.

2.62 People's mind and lifestyles do not necessarily follow the speed of the changing environment, and yet there is always a limitation for what local governments can do by

themselves. They need cooperation and collaborations with citizens as well as the private sector in order to make the entire society to get adapted to the growth and achieve a sustainable development.

2.63 The City of Yokohama, since the beginning of its population and economic growth, has worked closely with its people and firms in the city. The City has conducted a range of educational programs and campaigns to raise public awareness to gain understanding and consensus for its policies.

2.64 Recently designated volunteer groups organized by local communities have been actively engaged in beautification activities of parks and roads. Yokohama was also aware of the city government's limitation to lead the sustainable development on its own and actively utilized private firms and other existing organizations, such as community groups and NGOs, to help the urban development at the grassroots level. Cooperation and collaborations among the city government, citizens, and private sectors did not only help implementation of governmental policies, but also have enabled the city to make new types of challenges and achieve bigger success in high-level targets and goals, based on their shared visions for an ever-advanced sustainable city.

2.65 The following are some examples that represent Yokohama - style urban development that encourages private sector and citizens' participation.

Yokohama G30 Plan

2.66 The "Yokohama G30 Plan" is a project established by the City of Yokohama in order to cope with the increasing volume of waste generation driven by the rapid population growth during the late 20th century. To restrain this negative trend and facilitate waste recycling, the G30 Plan was enforced in January 2003.

2.67 Considering fiscal year (FY) 2001's 1.61 million tons of waste as a baseline, it aimed to reduce waste generation by 30% by FY2010.

2.68 To achieve this goal, citizens were required to participate in segregating their garbage into newly established 15 categories. At the enforcement of the G30 Plan, garbage collection offices did not pick up residential wastes which were not properly segregated.

2.69 As for commercial/ industrial wastes, these companies were also instructed to return waste to firms if inappropriate waste were discovered.

2.70 Enforcement of such strict rules required a high degree of public awareness and dedicated cooperation from both citizens and companies, so that the city widely conducted education and promotional activities with more than 11,000 seminars over a two- year period to explain how to reduce and sort waste.

2.71 About 600 campaigns were held at railway stations, and more than 3,300 awareness campaigns were organized at local waste disposal points. Eventually, local communities and schools also came to work together, to create a supportive, collaborative environment.

2.72 Citizen volunteer 'garbage guardians' explained proper sorting measures to citizens and sought cooperation from those who were not supportive of the new segregation measures.

2.73 As a result of these collaborative efforts, Yokohama's 30% waste reduction target was achieved in FY2005, five years ahead of target, and waste generation was reduced by

43.2% by FY2010. Thanks to solid waste reduction, two deteriorated incineration factories needed not to be operated. It provided a big impact to reduce the City budget. Collaboration with citizens and the private sector has made key contributions to the success of the effort.

Participation in Town Planning

2.74 Kohoku New Town is one of the 6 strategic projects of Yokohama City, which aimed to construct a multi-function new town in the suburbs, located 25 km southwest of downtown Tokyo. The basic concept of the plan was formulated by residents, the city government, and the developer, which is the Japan Housing Corporation (JHC, now the Urban Renaissance Agency).

2.75 These three bodies organized a “Kohoku New Town Project Promotion Council” to discuss the plan to create an ideal city whose inhabitants would play a major role in its development.

2.76 Residents were involved from the very initial stages of planning as main actors of the plan, with technical support from JHC and facilitation of Yokohama City.

2.77 It took a long time to discuss each issue and agree with stakeholders from the planning stage, but this effort enabled smooth and effective implementation of the project after consensus building. This organization was operated for 20 years from 1976 to 1996.

2.78 Such consistent and intensive participation of citizens was an innovative approach in urban planning and development, and became a model for other cities.

People’s Forests

2.79 City of Yokohama has protected forests and natural woods in participation with land owners within the city under the “People’s Forests” policy, established in 1971 as an original system of the City.

2.80 Today, 40 forest zones with a total area of 498 ha were registered as People’s Forests, where citizens can freely enjoy hiking or relaxing. 25 official volunteer groups were set up to protect and maintain these forests. The City made a long-term contract of longer than 10years with land owners, and provides a subsidy for greening and tax exemption for land.

2.81 In order to protect the beautiful and valuable greenery within the modern City of Yokohama, land owners and volunteers as well as the City maintain the forests together.

Urban Redevelopment Projects of Built-up Areas

2.82 In old-established built-up areas, problems of disaster prevention are serious such as aging building and infrastructure, narrow roads, etc. To redevelop these built-up areas, the project implementation method called “Urban Redevelopment Project” is legalized under the Urban Planning Law in Japan. From the planning stage, general orientation, location and size of the project are designated based on discussion and consensus building among stakeholders.

2.83 Upon land acquisition for urban redevelopment project, in addition to land acquisition system, "right conversion method" is applied. This method is to assess the property values (land, real estate) of existing rights, and owners receive properties with same values after the project by converting rights. The project implementation body develops buildings and public facilities, return properties to original owners based on right

conversion, and to sell surplus floor rights to the market for ensuring the project cost.

2.84 Totsuka Station of Yokohama City was promoted with commercial and business facilities and old-established residential areas around the railway station. On the contrary, there were many problems in terms of disaster prevention, since traffic congestion was serious because of mixed traffic with buses and cars, and buildings had been deteriorated, and roads were too narrow. To tackle with these issues, urban redevelopment project of Totsuka Station Area was designated under the urban plan with legal basis. The project was implemented based on right conversion system, with participation of right holders (owners of land and building, land holders, sub lessees, etc.). Most of right holders were private business entities, and about 30% of them continue business in the same area after the project. Furthermore, this project aimed to develop intermodal transfer facilities to improve accessibility of station users and traffic condition around station. The bus terminal and the pedestrian deck were constructed to connect railway station and bus, JR station and metro station, etc.

2.85 In general, it takes several years and decades from planning stage to completion of the urban redevelopment project. So it is indispensable to make consensus among stakeholders for improvement of the area in long-term.

Figure 2.14 Urban Redevelopment Project of Totsuka Station Area

1994	Designation under urban plan	Before Project  ↓ After Project 
1997	Project approval	
	Implementation of project (negotiation and consensus building with right holders, compensation, land acquisition, right conversion, etc.)	
2007	Construction	
2013	Completion	

Source: JICA Study Team based on materials from Urban Development Bureau, City of Yokohama

2.86 In this way, Yokohama has experiences with successful various initiatives in accordance with the sustainable urban development in cooperation with citizens and private sectors. As seen in the case of G30, to be cooperating with citizens and private sectors is possible to achieve a goal, a new challenge for the future urban as seen in Yokohama Smart City project. Know-how of citizen awareness and establish a system of these public-private partnerships can be a reference for the local governments face a number of challenges due to rapid urbanization.

Figure 2.15 Various Activities of Citizen's Participation

1) Mayor's Meeting with 10,000 Citizens

2) Town Walking for Barrier-Free Check

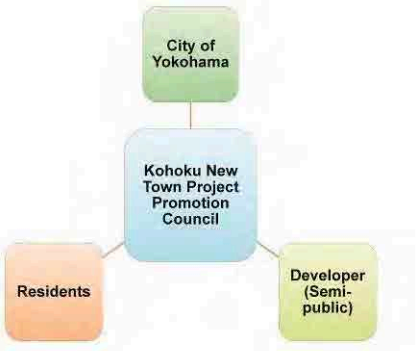
3) Workshop with Citizens

4) Volunteer Group for Park

5) G30 Campaign

6) People's Forests in Bugen-ji Temple

7) Kohoku New Town Project Promotion Council



Source: City of Yokohama (1,2,3,4,5,6), JICA Study Team (7)

6) Building a Resilient City through Comprehensive Disaster Prevention

(a) Flood Disasters

Disaster Prevention in Yokohama City

2.87 Building resilience towards various natural disasters is essential to realize a safe and secure urban environment.

2.88 Yokohama City's disaster prevention measures are taken under the strong coordination of the city, enterprises, and local residents. All stakeholders act under a risk management strategy stipulated by the city and demarcation of roles are clear.

2.89 Local residents regularly participate in disaster drills, which helps them to move effectively upon actual disasters. The city also publicizes various hazard maps (tsunami, liquefaction, flood, landslides) to help the stakeholders become more disaster-ready.

River Improvement

2.90 Tsurumi River in Yokohama City, classified as a 1st Class River, has a long history of intense flooding that made the river notorious as the "Violent River." As a result of rapid urbanization in its river basin beginning in the 1950s, natural environment such as forests and greenery were lost.

2.91 Roads were paved with asphalt and therefore without a natural reservoir, rain inflow to rivers was rapid, provoking the risk for inundation.

2.92 Therefore, Tsurumi River was one of the first rivers in the nation which underwent "Integrated Flood Control", i.e. river improvement, retarding basin, disaster prevention adjustment ponds, etc. and its effect has been recognized.

2.93 In Japan, a 1st Class River is directly managed by the Ministry of Land, Infrastructure, Transport, and Tourism, hence Yokohama City works together with the nation and Kanagawa Prefecture to ensure safety for a 50mm hourly rainfall (expected once in 5 years).

Comprehensive River Basin Management

2.94 Since Yokohama City's urbanization began from the coastal areas, densely populated downstream areas met difficulties to prevent floods due to limitations to increasing flow capacity by river expansion. In addition, housing development in the basin area brought about the increase of inflow to rivers.

2.95 Therefore, measures that enable storage of rainfall in the basin area are critical to increase safety from floods.

2.96 Hence, rainfall storage facilities in public areas such as school and parks have been adopted, and guidance through the "Land Formulation Guideline" to place rainfall adjustment ponds have been introduced, which both contribute to decrease rapid inflow of rainfall to rivers.

Drainage System Improvement

2.97 Another important flood prevention measure is the introduction of drainage facilities. It aims to ensure safety for a 50mm hourly rainfall (expected once in 5 years) and 60mm hourly rainfall (expected once in 10 years) for lowlands which heavy damage from inundation is expected. Pumping facilities and storm water culverts are being introduced

for the latter.

(b) Earthquake Disasters

Linking with Regulations

2.98 Another factor for success was that disaster prevention was linked with regulations for construction, hence it was made sure that buildings were disaster resistant before they were actually approved and built.

2.99 Embedding such aspects in regulations was an innovative system for disaster mitigation, and enabled to decrease the potential of disaster occurrence from steps of planning and construction.

Real-Time Earthquake System

2.100 The Real-Time Earthquake System is a system which aims to grasp the situation of various locations in Yokohama City after the occurrence of an earthquake.

2.101 This enables swift initial movements and the rapid set-up of a disaster countermeasures office. There are a total of 42 sensors in the city for the local residents to receive information about earthquake prediction on a real-time basis, and contributes to disaster mitigation.

(c) Response upon Disaster Occurrence

Local Disaster Prevention Points

2.102 Yokohama City was the first to designate elementary schools as local disaster prevention points. This location is not only used as a safe shelter during disasters, but also used as a stronghold for information transmission and communication, storehouse for lifesaving kits, food and water, other living supplies, and emergency toilets.

2.103 Elementary school s in Japan are designated per community, and actually this unit is just right for planning local disaster measures.

2.104 Building on this learnt experience, Yokohama City introduced “local disaster prevention points” which became the new standard for other municipalities and the nation. This system was innovative because it was linked to the community unit and enabled disaster mitigation at the community level.

Underground Water Tank

2.105 Yokohama City has underground water tanks which can be used upon disastrous events. In normal times, it is an underground water tank which is a part of the water pipeline network, and should the Water pressure decrease, the inflow/outflow valves close, enabling the tank to become a store of clean drinkable water. Such underground water tanks are set up in schools, which are designated as regional medical first-aid stations, which are far from water distribution facilities.

Reacting upon Emergency

2.106 Upon the occurrence of disasters, an Emergency Transport System which connects major facilities (city hall, civil engineering offices, firehouses, hospitals) to emergency roads is enacted, and buildings along emergency roads are made earthquake-proof to ensure smooth transport during disastrous times.

Figure 2.16 Disaster Management Facilities and Activity

Rainfall Adjustment Pond – Normal Condition	Rainfall Adjustment Pond – Upon Rainfall
	
Underground Water Tank for Emergency	Disaster Prevention Training at the Local Disaster Prevention Point
	

Source: City of Yokohama (1,2,3), Asahi Ward Office, City of Yokohama (4)

7) Providing 24-hour lifeline for All Citizens

From the Source to the City

2.107 Emerging cities face challenges to facilitate necessary infrastructure in a short period to cope with the rapid population growth. Water is one of the essential infrastructures to meet basic human needs.

2.108 Lacking water could cause serious damage to citizens' lives and low quality of water affects people's health. In addition, an excessive use of well water by households and companies could cause land subsidence resulting in serious flooding paralyzing city functions.

2.109 Since we started a water supply system and a sewer system in 1869 and in 1887, respectively, as the first modern system in Japan, the City committed steady development even amid rapid population growth, dramatically increasing the reach of both the water supply and sewer system.

2.110 Currently, the water supply and the sewer system have coverage of 100% and 99.8%, respectively. During the course of network development, Yokohama realized that to ensure not only a stable supply but also high-quality water, it is important to return to the basic principle and protect well springs.

2.111 Yokohama continues to preserve the Doshi Watershed Protection Forest, about 2,800 ha of water source land in Doshi Village, which is about 70 km from Yokohama. This provides confidence for Yokohama and enables us to develop a long-term plan of providing high-quality water.

Phasing Approach to Ensure Implementation

2.112 In order to meet a rapid demand increase, Yokohama took a phasing approach and expanded its water supply network eight times during 120 years. The water supply population has been increased steadily according to the population increase of the City.

2.113 On the other hand, the development of a wastewater system had lagged behind the population increase as shown in the chart.

2.114 The city adopted a phasing approach with two methodologies to install sewer systems, the combined system and the separate system. In the early stage, the City applied the combined system collecting wastewater and rain water together in order to install the system rapidly and cost-efficiently at a city center; during the expansion period, the separate system was adopted to be implemented in the rest of the city, partly utilizing private funds.

Environmental Friendly Management of the Water Cycle

2.115 Rapid urbanization put pressure on the environment. Sewage contamination and factory effluent deteriorated river water quality and exuded a bad smell.

2.116 Expanding the sewage system and wastewater treatment plant together with appropriate factory effluent control and guidance, Yokohama achieved dramatic reduction of BOD of rivers.

2.117 Discharged water is regularly inspected to assure a satisfactory level of quality.

Well-Functioning Infrastructure as a Network

2.118 Developing a modern water supply and sewer facilities system is one step, however, providing secure and safe operation and maintenance during a life cycle is another key factor to maintaining high-quality water.

2.119 Water source land is about 70 km from Yokohama and the total length of the pipes from the water intake to the water supply is about 9,200 km. Despite the considerable length, the rate of leakage is only less than 5%, which can be only achieved by continuous maintenance and operational management. Moreover, the low rate of leakage enabled efficient expansion of the water supply network with a minimum of funds.

System of User Pay

2.120 Financing of infrastructure development is another challenge for emerging cities.

2.121 Yokohama, as other cities in Japan, introduced the principle of user-pay on water and wastewater charge and the city government successfully disseminated the concept. With a matured water supply and wastewater system in recent Yokohama, user charges contribute to cover operation and maintenance for assuring 24-hour service of the system.

Figure 2.17 Water Supply and Treatment Cycle

1) Doshi Watershed Protection Forest	2) Waterworks	3) Stream where treated wastewater is discharged
		

Source: City of Yokohama

Figure 2.18 Service Coverage of Sewerage and Water Supply and BOD at Rivers by Year

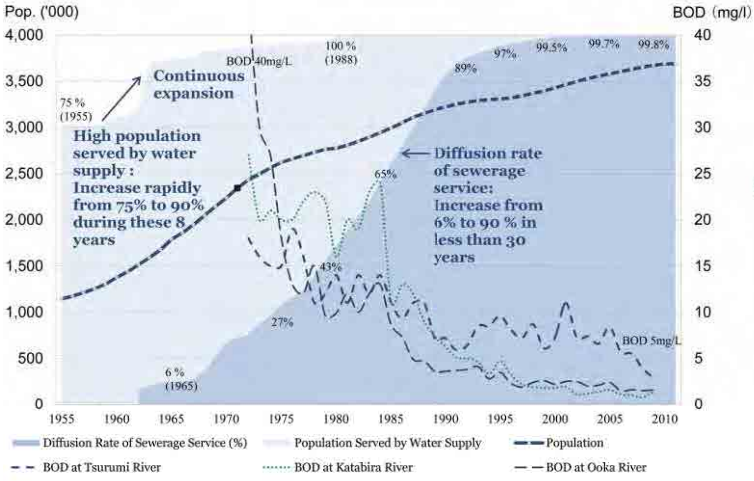
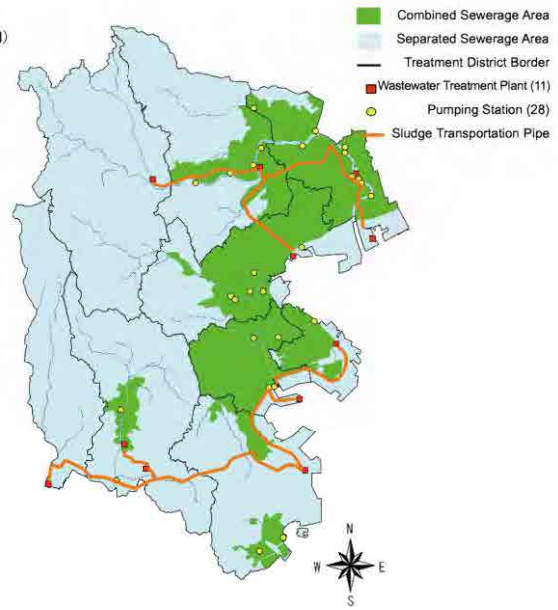


Figure 2.19 Coverage of Combined/ Separated Sewerage Areas



Source: City of Yokohama

8) Continuous Innovations

Challenge with "New Urban Issues"

2.122 Yokohama experienced rapid development from a devastated postwar stage in the 1940s to a prosperous modern city within about 60 years, overcoming issues such as urban sprawl, lack of infrastructure, and pollution.

2.123 Urban challenges for the City did not stop there, however. Instead the City has continued making innovations and efforts to deal with newly arising urban issues.

2.124 A new trend is that globally discussed need for energy conservation and emission reduction to tackle global warming and the issues of decreasing natural resources. Cities, which consume lots of energies and emit the majority of greenhouse gases, are required to be "smarter" in energy usage and look for alternative, renewable resources to facilitate more efficient and ecological life-styles and green economy.

2.125 Another trend is aging and decline of population in large cities. In Yokohama, its population is expected to start declining in 2019. The elderly population above 65 years old

has exceeded 21% in 2013, and is expected to grow close to a million by 2025. At the same time, More and more women are willing to continue their work after having children so that there is an urgent need for the city to create such an environment which can support busy parents.

2.126 Without adequate support mechanisms, the birth rate may decline even further, accelerate aging of the population and shrinking of the labor force. Also, Yokohama believes that women's participation and contribution to its economy and society is essential in order to strengthen and rejuvenate the city. It is a challenge to eliminate any obstacles and create a supportive environment for both working mothers and their children.

2.127 Renovation of aging infrastructure is also an urgent need. Faced with global warming and potential natural disasters, "renovation" does not simply mean updating the old infrastructure, but we need to create much "smarter" and "resilient" solutions.

2.128 In Japan, Yokohama plays a leading role to counter these new challenges with close collaborations with the citizens and private sector. In 2011, the City was selected by the Government of Japan as a "FutureCity", pursuing to be a model city in terms of advanced technology, socioeconomic systems, services, business models and city building in order to resolve these new issues.

2.129 Yokohama people are forward-looking and eager to make changes, continuously trying new experiments and innovations.

2.130 The role of the city government is to provide them opportunities as well as necessary incentives and support to facilitate them forming new ideas and making actions.

Carbon Reduction Measures

2.131 Since 2010, the city has started an empirical examination of the "Yokohama Smart City Project (YSCP)." The latest smart technologies, including PV generation, storage batteries, various

2.132 levels of energy management systems (EMS), are installed for operational experiments in many places in Yokohama City with over 1,900 households installed with Home EMS (HEMS) , which are connected to the Community EMS (CEMS) . The original project vision was created by the city government, which then proposed the idea to the public to see if the private sector would be interested in participating.

2.133 Companies with a variety of smart technologies joined the project as a result. A detailed master plan was created, a project management office was established, and the project was put into operation by these private players. The city also promotes "Yokohama Mobility Project Zero", which aimed to popularize electronic vehicles and eco-driving, in collaboration with an auto manufacturer.

2.134 These are efforts to develop a model of an eco-friendly, smart city by means of cooperation among citizens, private companies, and the City Government, and to export the successful model to other cities in Japan and other countries.

Life Innovations

2.135 The City of Yokohama, has been dedicatedly promoting life innovations industry especially in the Keihin Coastal Area and is assigned by the national government as one of Japan's "Comprehensive Special Zones for International Competitiveness Development (CSZICD)". Currently, Yokohama promotes 18 R&D projects in its 7 areas of focus; namely,

preventive medicine, diagnostics, regenerative medicine, IT (medical databases), drug development, medical device development, and a support mechanism for pharmaceutical/ medical device permission process. The aging society and the latest technologies brought about new market opportunities for both ventures and large global firms. The city helps these innovative players access to the national tax incentives, easing of restrictions, financial support, etc. within the CSZICD.

Improved Accessibility to Child Care Support Facilities

2.136 In April 2013, Yokohama achieved “zero children on waiting list” for nursery services. For the last decades, large cities have faced capacity shortage in nursery schools, leaving many children on waiting lists and preventing their mothers from going to work. In order to solve the issue, the city has not only built new nursery schools but also introduced new measures to improve accessibility of these services. The city promoted the provision of nursery services by NPOs and other organizations utilizing vacant rooms in regular apartment buildings, which supplemented the shortage of designated nursery facilities. The city also has assigned nursery concierges in each district to provide related advice and information.

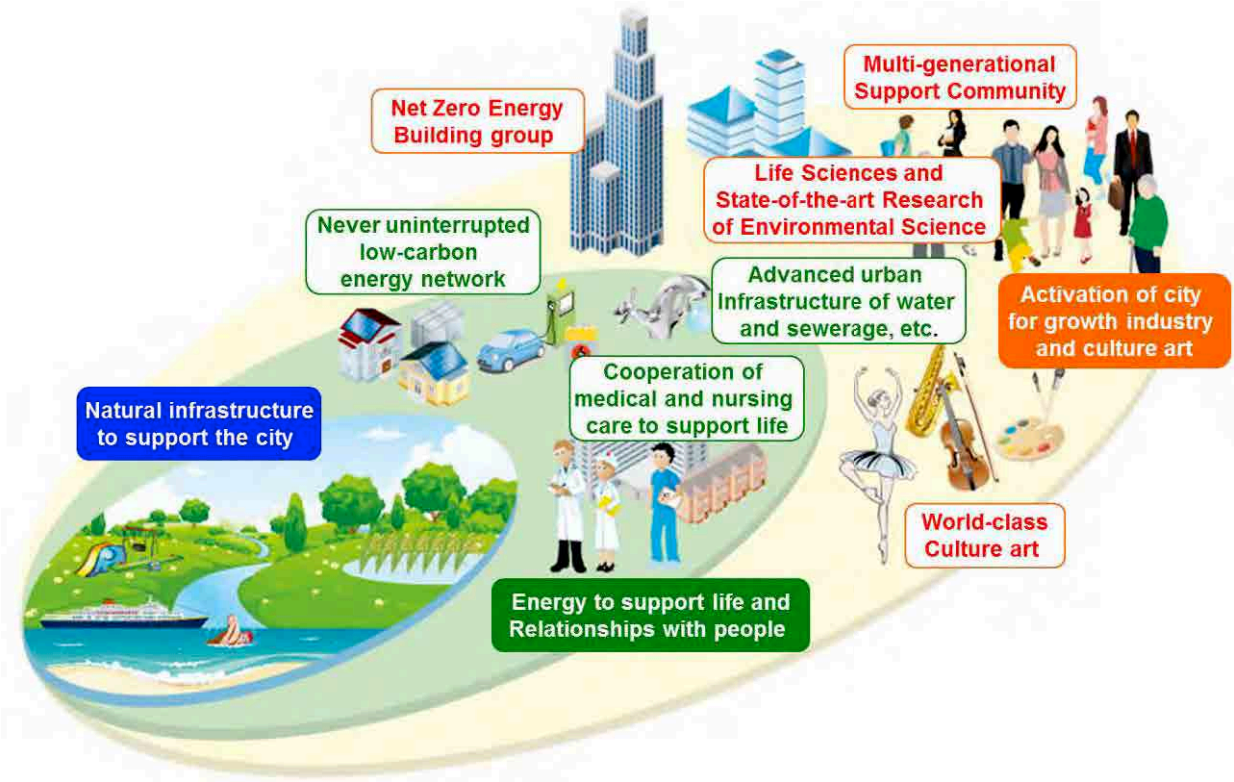
2.137 This “Yokohama method” was highly recognized by the national government and is now applied to the national plan of ”Accelerate the zero childcare waiting list project” for the whole of Japan.

Figure 2.20 Continuous Innovation

Hama Wing (Wind Power Plant)	Electric Vehicle	Child Care Service
		

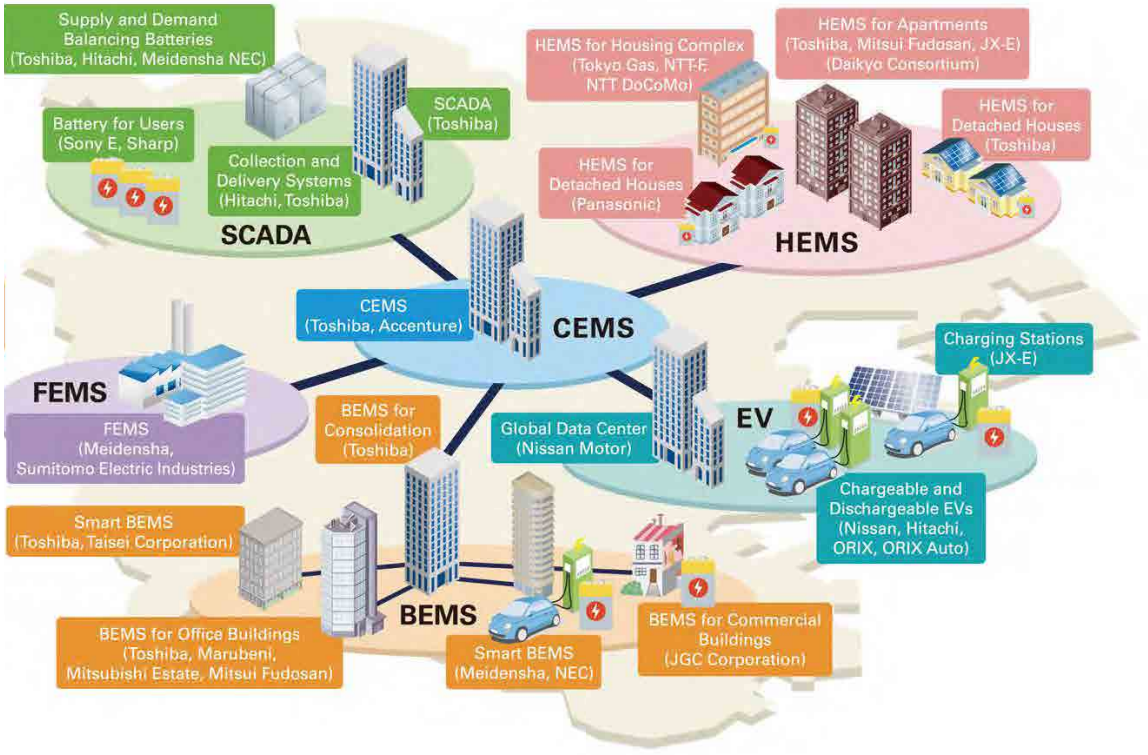
Source: City of Yokohama

Figure 2.21 FutureCity Initiative



Source: City of Yokohama

Figure 2.22 Yokohama Smart City Project (YSCP)



Source: City of Yokohama

(3) Yokohama's Activities in Overseas

1) Support for Private Sectors of Yokohama City for Overseas Business Promotion

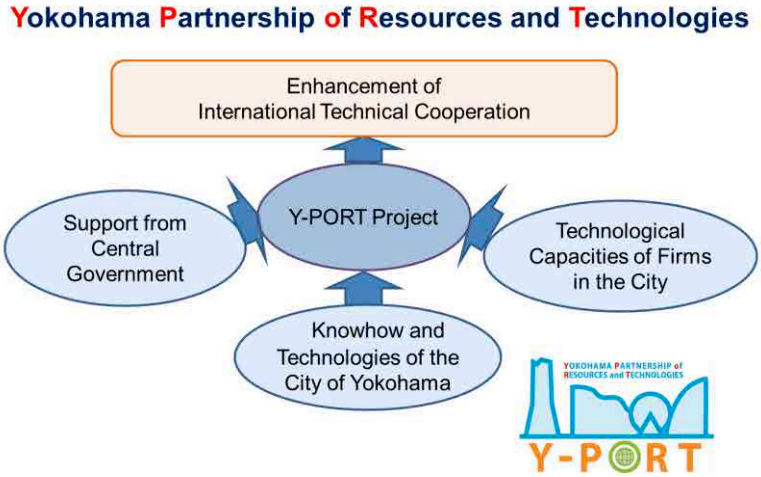
(1) Y-PORT

2.138 Yokohama City has commenced international technical cooperation aiming for "Sustainable Urban Development" by fully utilizing its experiences and know-how for urban development and also environmental technology of the private sector in the city.

2.139 Y-PORT, which refers to the Yokohama Partnership of Resources and Technologies under Public-Private Partnership, was launched in 2011. In this initiative, the basic partnership was formulated and strengthened with JICA, JBIC and other governmental agencies along with ADB and other international donors, and the private sector.

2.140 Y-PORT is further undertaking technical cooperation for sustainable urban development with Cebu City in the Philippines and Danang City in Vietnam. Yokohama City concluded memorandums to promote sustainable urban development in Cebu, Da Nang and Bangkok respectively. Advisors from Yokohama City have been dispatched to Cebu and Bangkok for JICA projects.

Figure 2.23 Y-PORT



Source: Policy Department, City of Yokohama

Figure 2.24 Ceremony of MOU between Yokohama City and Da Nang City

2.141 Y-PORT promotes international technical cooperation between Yokohama City and developing cities, and to supports private sectors in the city to start overseas operations for infrastructure development. These events are announced by the website and e-mail to invite private sectors interested in.

Table 2.2 Details of assistance provided by Y-PORT

Program	Details	Type of assistance
Y-PORT workshops, seminars, and open forums	・Holding workshops and seminars in which the City, private sectors, universities, NGOs, and/or the representatives from the national government and related agencies can share information and opinions on overseas business and international cooperation	・Seminars, study sessions
"Yokohama Day"	・Hold a conference called "Yokohama Day" as a part of the "Smart City Week" where many government officials and private sectors from overseas attend every year, to introduce the various activities conducted by the Y-PORT initiative as well as business activities by the companies based in Yokohama. ・Holding exhibition event along with the above conference to provide companies in Yokohama an opportunity to introduce their services and products for the visitors from abroad	・Seminars, study sessions ・Support in displaying at trade fairs (joint pavilions
"Y-PORT Forum"	・Holding seminars on overseas business supports along with networking events, to which representatives from the national government as well as government officials from abroad are invited	・Seminars, study sessions

Source: JICA Study Team from the Y-PORT Programs website

(2) Development of overseas business by companies in the City of Yokohama

2.1 Through such verification projects, effectiveness of some specific technologies has already been testified, such as the impact of the consolidated BEMS (Building Energy Management Systems), which successfully reduced 22% of the peak energy consumption during the experiment, slightly exceeded the originally expected 20%. HEMS, or Home Energy Management Systems also have been widely installed in approximately 2,500 houses in the city within the last 3 years between 2010 and 2012, indicating that the City is successfully incorporating its citizens in its program pursuing to create a sustainable city. With the "FutureCity" initiative, the City of Yokohama is aiming to introduce these pioneering technologies and project models to overseas as well.

(3) SME support by Yokohama Industrial Development Corporation (IDEC)

2.2 "Yokohama Industrial Development Corporation (IDEC)" is the only "SME support center" in the city that has been commissioned by the City of Yokohama to provide business management support and consulting services. Under their support program for global business, it provides SMEs assistances for international business expansion mainly in Asian countries, such as China, Taiwan, Thailand, Vietnam and India, in particular. The range of assistance programs are as shown below.

Table 2.3 Details of assistance provided by IDEC

Program	Details	Type of assistance
Overseas business consulting	・Specialists on international business will provide consultation to the city's SMEs that are considering overseas expansion, such as merchandise trades and direct investment.	・Specialist consultation ・Information provision
Asia support desk	・Business consultation, information provision, local site visit coordination, trade fair exhibition/business meeting support, partner search by leveraging support desks in Thailand, Vietnam, Myanmar, Cambodia and Shanghai	・Specialist consultation ・Local visit arrangement ・Support in displaying at trade fairs (joint pavilions, specialist allocation) ・Overseas business partner introduction
Holding of seminars and business meetings	・Hold seminars that provide the latest economic/industrial information relating to the target countries/regions which are required for engaging in overseas business in cooperation with foreign economic organizations or financial institutions such as the 3 Mega Banks in Japan, or events for matching business partners such as business meetings with foreign companies	・Seminars, study sessions ・Holding of business meetings

Source: Prepared by JICA Study Team from the IDEC brochure

2.3 In addition to the above, "Project for the development of overseas markets by SMEs" is being implemented as a system for assistance by the City's Economic Affairs Bureau. Assistance provided are as described in the below table.

Table 2.4 Details of assistance provided by Yokohama's Economic Affairs Bureau

Program	Details	Type of assistance
Yokohama City's project for the development of overseas markets by SMEs	・Advice on development of overseas markets ・Holding of seminars on export practices ・Subsidy for cost to display at overseas exhibitions/business meetings (max 200,000 yen) ・Financial support (low interest loans for equipment fund/working capital, subsidy for credit guarantee fee) ・Subsidy for foreign application (subsidy for a part of cost on foreign patent, design registration, trademark registration (including counter-measures for misappropriated applications) and utility model registration. Max 1.5 mi yen (patent), 600,000 yen (design, trademark)). Within 1/2 of the subject expense	・Specialist consultation ・Information provision ・Seminars, study sessions ・Subsidy for cost (display at exhibition) ・Loans ・Subsidy for cost (credit guarantee fee) ・Subsidy for cost (foreign application)

Source: Prepared by JICA Study Team from "Project for the development of overseas markets by SMEs: application guidelines - Yokohama's Economic Affairs Bureau'"

2) Overseas expansion by companies in the City of Yokohama

2.4 The below table shows companies in Yokohama City that have been already working on overseas infrastructure projects (water & sewerage, environmental management, port/logistics, low carbonization) as of now, through the application of the SME assistance scheme by the Ministry of Foreign Affairs or JICA as mentioned above, or through their own initiatives.

2.5 The City's companies, mainly large-scaled companies, have steadily built track records in overseas market penetration in most of the infrastructure sectors targeted in this study. As for the port sector, Yokohama Port Corporation (formerly a 100% city-owned company) had mainly been handling construction, renting, and management of the port terminals in Yokohama, but it has not entered the overseas market as of now. In the area of logistics, however, there are multiple companies that have widely expanded their business

overseas including Asia, due to the form of business. Meanwhile, most of the companies developing overseas business are large companies and the number of SMEs is limited.

Table 2.5 City's companies engaged in overseas infrastructure projects (sample)

Company name	Sample case
JFE Engineering Corporation	**<Environmental management>** - Shandong Province, China: incinerator plant for household wastes (deliver equipment to plant, provide instructions on facility designing and operation) - Shenyang City, China: restaurant kitchen waste methane fermentation/power generation model project (treatment of garbage from restaurant, power generation project) **<Low carbonization>** - Mindanao, Philippines: waste heat recovery power generation project (supply facilities, install equipment. installment engineering works handled by JFE Civil Engineering & Construction Corp) - West Sumatra, Indonesia: cement heat recovery power generation project (joint construction of power generation facilities)
JGC Corporation	**<Water & sewerage>** - Tianjin City, China: seawater desalination project - Acquisition of 100% shares of UAA, an Australian entity of a UK water operator (invested as a member of a consortium with Mitsubishi as the largest shareholder) **<Low carbonization>** - Luzon, Philippines: manufacturing/sales of bioethanol, electric power sales project - South Cordoba district, Spain: solar power generation project
Chiyoda Corporation	**<Low carbonization>** - Massa Martana, Italy: solar energy verification project, investment in Archimede Solar Energy (ASE) with which the company is cooperating under the project
Hitachi, Ltd	**<Water & sewerage>** - Gujarat, India: seawater desalination project - "Specialized International Services", a company in Qatar, and subsidiary Hitachi Plant Technologies, Ltd established a JV that will handle the EPC project for water & sewerage/industrial wastewater treatment facilities, etc. in Qatar - Acquisition of 20% shares of "Male' Water and Sewerage Company", a water & sewerage operation company in the Republic of Maldives **<Low carbonization>** - Maui , Hawaii: smart grid verification project
Amcon Inc.	**<Water & sewerage>** - Delivered more than 2,000 original sludge dehydrators through local agents in 50 countries worldwide
Uyeno Green Solutions	**<Low carbonization>** - Established a JV with a local company in the Philippines "Transnational Renewable Energy Corporation (TREC)" in 2011, and operates a solar power generation business
Inter Action Corporation	**<Low carbonization>** - Solomon Islands: electrification project in remote areas through the Solar Home System - Beqa, Fiji: solar power smart grid system introduction project
Nissin Corporation	**<Logistics>** - Owns local affiliates, group companies and logistics basis in Asia (Vietnam, Indonesia, Singapore, Thailand, China, etc), the Americas and Europe, and engages in general logistics services
Suzue Corporation	**<Logistics>** - Owns local affiliates/agents in Asia (Vietnam, Thailand, Indonesia, China), and engages in general logistics services
Maruzen Showa Unyu Co., Ltd.	**<Logistics>** - Owns local affiliates, group companies and logistics basis in Asia (Vietnam, Thailand, Singapore, China), the Americas and Europe, and engages in general logistics services
Utoc Corporation	**<Logistics>** -Owns local affiliates and group companies in Asia (Vietnam, Thailand, Singapore, China) and the Americas, and engages in general logistics services

Source: The Nikkan Kogyo Shimbun（May 31, 2012）, FujiSankei Business i.（July 18, 2012） and company websites

2.6 In the water & sewerage sector, the City's Environmental Planning Bureau established "Yokohama Water Business Conference" which aims to facilitate companies in related sector start overseas business in cooperation with Y-PORT. The Conference is participated by major firms (such as JFE Engineering) and SMEs (149 members as of 2013), but the number of SMEs developing overseas business is limited. The technology possessed by member companies cover a vast range of the water & sewerage services from parts supply to plant designing/construction and business operation/maintenance (refer to below table). In order to support the City's SMEs, the Conference has been arranging various programs, such as site visits to developing countries accompanied with networking events for local water & sewerage public corporations and the City's companies, as well as seminars to introduce the system on assistance to SMEs, and promotes international technical cooperation. The City's water & sewerage service/products providers are expected to find way to develop overseas business leveraging, these support programs in near future.

Table 2.6 Water Projects by Yokohama Water Business Conference's Member Companies

Water desalination, utilization	Construction of dams, rivers, canals, transportation of source water, seawater desalination, etc.
Water purification, supply, distribution	Construction/operation & maintenance of purification plants, water quality management, construction and operation of pipes and water stations, etc.
Water discharge, treatment, disaster prevention	Construction/operation & maintenance of pipelines, pump stations and sewerage treatment plants, etc.
Treated water reuse, energy use	Water recycling, power generation using digestion gas, etc.

Source: Policy Bureau, City of Yokohama

3) Issues faced by Yokohama's companies and needs for assistance

2.7 Hearings were conducted on issues faced by Yokohama's companies aiming to go abroad, with particular focus on SMEs, and measures on assistance that such companies would expect the City or the Government to provide. Comments received through the hearings were as follows.

(a) Barriers in regulations

- Complicated regulations: We have been engaged in technical cooperation and technical introduction in developing nations, such as Hue in Vietnam through initiatives including the CITYNET[1]. Many of the participating companies are those aiming for overseas expansion, but these have currently stopped at the international cooperation stage and have not moved on to project development. We hear that there are cases in developing countries such as Vietnam, where complicated regulations on installing equipment, etc are making entry by Japanese companies difficult. Government agencies are expected to provide support by negotiating with developing nations for improving their laws/regulations. (Yokohama Water Business Conference)
- Foreign currency restrictions, tax system, qualifications: Technical barriers in

[1] A network of municipalities with participation from over 100 cities, mainly from countries in the Asia Pacific. Shares knowledge and common practice among member cities and promotes international cooperation.

entering overseas water projects include issues on foreign currency restrictions, tax system, and qualifications. (water related company)

(b) Mismatch with the needs of developing countries or ordered technical specifications

- Mismatch between developing countries' needs: As "Smart Community" sounds good, government officials initially listen with interest. However, when talks become specific such as land acquisition and financing burden, they become passive. We feel that it is difficult to apply Japan's highly advanced smart community technology unless the country is mature to a certain extent. Awareness towards low carbonization and energy-saving is still not high in cities in emerging countries. (low carbonization related company)
- Needs for introducing advantages of Japan's technical specifications from upstream: Difficulty in penetrating developing countries is that the product specification is different from Japan and Japan's standard cannot be introduced as it is. In particular, the parts requested are of overseas standard, in case foreign consultants are present. We believe that an environment needs to be created under which it would be easy for Japanese companies to enter from the upstream. (water related company)

(c) Responding to comprehensive orders such as full turnkey/PPP, comprehensive provision of services and technology

- Inability to undertake comprehensive services: In the case of placing an order for a domestic project in Japan, the ordering party has high technical skills and management capability, and orders are placed separately by facility, by equipment, etc. Japanese companies have track records in the construction of individual facilities, but have little experience of constructing/operating an entire facility. In the case of overseas tenders, the ordering party has less technical skills, and in many cases, orders are placed for the construction or operation & management of the entire facility which Japanese companies are less experienced to handle. We get eliminated at the pre-qualification assessment stage. (environmental management related company)
- Partnering: It is particularly difficult for SMEs to enter overseas markets alone, and it would be a help if the City assisted in partnering for forming an alliance. We manufacture water pipe parts, and feel the need to tie up with a company that manufactures peripheral equipment in going abroad. (water related company)

(d) Marketing for the City's companies

- Introduction of the technology and products of the City's companies: We wish the city government would introduce the City's companies that have the relevant technology/products when there is a request/query for a specific technology/product from the government of developing nations. (water/ environmental management related company)

(e) Market entry strategy

- Development of an overseas market entry strategy: We participated in the local visit arranged by Yokohama City and visited an overseas site for the first time. We were able to meet local government officials with Yokohama, and gain a good

understanding of local needs. But, we do not know how to move forward from here. (water related company)

(f) Market study and feasibility study

- Market study and technology verification: Japan's standard on water plan/design is sometimes excessive for a facility in a developing country, according to the situation of local operation and management. As there are cases where Japan's common practice is not the local common practice, sufficient study needs to be conducted on the local situation and verification of the technology to be introduced is also necessary. (environmental management related company)
- Market study and development of an entry plan: We had been engaged in domestic business only, but are considering entry into foreign markets in future. We need to develop a specific entry plan by conducting an analysis of the area where we have a competitive advantage overseas, considering the way to do business and understanding developing countries' needs. (port related company)
- Grant for F/S cost: We applied twice for the government's F/S assistance program for conducting a F/S in Danang, but were not identified. Danang government was highly interested, but we cannot engage in overseas business without prior study. We wish to apply for the government's assistance program as it is difficult for us SMEs to bear a large risk, but it is highly competitive. As we are already receiving assistance for F/S in another country, the government may be wishing to give an opportunity to others. (environmental management company, several water related companies)

2.8 As described above, we understood that a wide range of issues existed for the City's companies in entering foreign markets, such as difference in the developing countries' legal system and needs, the need to establish a structure that can provide more comprehensive or wider range of technology/service package in order to respond to comprehensive orders, lack of knowhow on developing a specific entry strategy, and financing in preparation for a project. In particular, solutions to issues on the legal issues and upstream issues, such as having the developing countries' government understand the advantages and importance of Japanese technology, cannot be produced by the private companies alone, and support from the government and municipalities is required. For the provision of a comprehensive service/technology, particularly in the water sector, domestic companies currently provide each element technology individually, and partnering would be important in going abroad. Many companies, mainly SMEs, are seeking for assistance in the development of entry strategies and knowhow/financing required for specific entry processes such as performing market studies and F/Ss.

4) SME assistance by the government and local governments

(1) Outline

2.9 As can be understood from the above circumstances, there is a large need for public support in going overseas, particularly by SMEs, and we decided to first review the existing system on assistance in overseas market penetration by SMEs. We confirmed details of the assistance system by the Japanese government, relevant agencies and Yokohama's own program, and sorted out the information. We also reviewed measures by other municipalities and an overseas city on assistance, to use as reference in future when

considering necessary support measures[2].

(2) Japanese government's assistance system

2.10 Details of assistance provided by the Japanese government and related agencies to SMEs are sorted out in "SME Overseas Expansion Support Measures ("Chusho-kigyou kaigai –tenkai shien-shisaku shu)" issued by The Small and Medium Enterprise Agency. For example, according to this document, the following assistance programs are categorized and provided for each of "1. Plan development stage", "2. Project preparation stage", and "3. Project initiation/expansion stage."

Table 2.7 Assistance Programs by the Japanese Government and Relevant Agencies (Sample)

Program	Details	Type of assistance
1. Plan development stage		
1) Information gathering support	**[JETRO]** ・Overseas information file, trade affairs online course, seminars, lectures **[SME Support, Japan]** ・Globalization support report, overseas expansion seminars **[Japan Chamber of Commerce and Industry]** ・SME globalization support navigator (study sessions, reports, etc.) **[Tokyo Small and Medium Business Investment & Consultation CO., LTD]** ・Overseas related seminars **[Japan Patent Office]** ・Data bank of information for emerging countries' intellectual property etc.	・Information provision ・Seminars, study sessions
2) Overseas expansion advisor	**[SME Support, Japan]** ・Globalization support advice **[JETRO]** ・Trade & investment consultation, export support consultation service **[Tokyo Chamber of Commerce and Industry]** ・SME global expansion advisor system **[Shoko Chukin Bank]** ・SME overseas expansion support desk etc.	・Specialist consultation
3) Study/plan development support	**[Ministry of Foreign Affairs]** ・ "Overseas Expansion of SMEs and ODA for Developing Countries" project (Max: around 3,000-100 mil yen) [3] **[SME Support, Japan]** ・F/S support project (Max: around 3.5 mil yen [within 2/3 of expenses]) **[JETRO]** ・Overseas small study service ・Support service for promising export projects	・Subsidy for cost (F/S, verification projects) ・Information provision
2. Project preparation stage		
1) Development and securing of human resource	**[SME Support, Japan]** ・Contract affairs and presentation training ・Overseas expansion project controller training **[The Overseas Human Resources and Industry Development Association (HIDA)・JETRO]** ・Global human resource development internship dispatching project **[JICA]** ・Global human resource recruitment/development (introduction of individuals that have experienced JICA volunteer, acceptance of volunteers) etc.	・Seminars, study sessions ・Internship dispatching ・Introduction/acceptance of human resource
2) Assistance in the development of overseas markets	**[JETRO]** ・Database for projects inquired ・Overseas buyer invitation, individual business meetings ・Overseas exhibition display support (establishment of a Japan Pavilion)	・Introduction of projects inquired ・Holding of business meetings

[2] Support programs by each organization listed in this section are only measures clearly specified on the organizations' website or in service introduction materials as their assistance program.

[3] Based on FY13 revised version.

	・Dispatching of overseas site visit teams **[SME Support, Japan]** ・Domestic/overseas exhibition display support (specialist consultation, allocation of interpreters, translation of materials, etc.) **[National Federation of Small Business Associations]** ・Exhibition display project (subsidy for cost). Max: 1.2 mil yen (within 6/10 of the subject cost) **[Ministry of Foreign Affairs]** ・SME non-project grant aid (grant products to developing countries depending on development needs) etc.	・Exhibition display support (joint pavilion, allocation of specialists/interpreters, etc.) ・Subsidy for cost (display at exhibition) ・Specialist consultation ・Site visit teams ・Grant aid
3) Development of products for overseas/trial marketing support	**[Small and Medium Enterprise Agency]** ・ "JAPAN brand development support project (support in joint effort in development of business strategies among multiple companies, as well as in the development of relevant products and displaying them at exhibitions)". Max subsidy for strategy development support: 5 mil yen (fixed). Max subsidy for support during the brand establishment stage: 20 mil yen (within 2/3 of expense) ・Global technology cooperation support project (subsidy for a part of expense required for the development of preproduction samples and development of sales channels, assuming joint overseas expansion by multiple companies). Max: 50 mil yen (within 2/3 of expense). Max period: within 3 yrs.	・Subsidy for cost (strategy development) ・Subsidy for cost (technology development, product development, display at exhibition)
3. Project initiation/expansion stage		
1) Procurement of Finance and insurance	**[Shoko Chukin Bank]** ・Overseas expansion support (Overseas 21) (loans for start of business/business expansion of overseas affiliate, information provision) **[Japan Finance Corporation]** ・Overseas expansion funds (loans for equipment fund/working capital for overseas business), standby credit system (debt guarantee) **[Japan Federation of Credit Guarantee Corporations]** ・Guarantee system relating to overseas investments (debt guarantee for investment/loans to local affiliates) ・Guarantee system relating to special L/C (debt guarantee for domestic financial institutions issuing a L/C to local financial institutions) **[Nippon Export and Investment Insurance]** ・Overseas business fund lending insurance (insurance for short-term borrowings by local affiliates from local financial institutions) ・Export Credit Insurance for SMEs (insurance on country risk/credit risk when exporting) **[SME Support, Japan]** ・Fund investment project (establish a venture with an investment fund to support SMEs' smooth financing and hands-on assistance)	・Loans ・Information provision ・Guarantee system ・Trade insurance ・Fund investment
2) Consultation on intellectual property rights/legal issues	**[Japan Patent Office]** ・Regional SMEs' foreign application support project (subsidy for a part of the overseas patent application cost). Max: 1.5 mil yen (patent application), 600,000 yen (design, trademark application) (both: within 1/2 of expense) **[Japan Institute for Promoting Invention and Innovation]** ・Project to support measures against foreign industry property rights invasion **[JETRO]** ・Consultation service for damage from counterfeit products/ pirated copies ・Subsidy for invasion investigation cost (subsidy for a part of the investigation expense for identifying the manufacturer of counterfeit products/ pirated copies and distribution routes). Max: 3 mil yen (within 2/3 of expense) etc.	・Subsidy for cost (foreign application, invasion investigation) ・Specialist consultation
3) Consultation at the time of /after the initiation of overseas business	**[JETRO]** ・Support service for companies expanding overseas (provision of information on economy, industry, systems, individual consultation) **[Ministry of Foreign Affairs]** ・Support program for Japanese companies through the diplomatic establishments abroad (information provision based on individual consultation, requesting counterparty government for the improvement of legal procedures, etc.)	・Information provision ・Specialist consultation ・Support in communicating with counterparty government
4) Development/securing of human resource for	**[HIDA]** ・Receiving trainees in support of overseas business expansion (subsidy for receiving local engineers to trainings in Japan, holding introduction trainings,	・Subsidy for cost (human development)

local subsidiaries	advice, etc.). Subsidy for 2/3 of subject expense ・Overseas trainings in support of overseas business expansion (2-3-day seminar held locally by HIDA) ・Specialist dispatching in support of overseas business expansion (HR development support through dispatching lecturers). Subsidy for 3/4 of the cost for dispatching specialists, company to bear 7.5% of total operating cost	・Holding of seminars

Source: JICA Study Team from "Chusho-kigyou kaigai –tenkai shien-shisaku shu" by the Small and Medium Enterprise Agency

(3) Assistance system at other local governments and countries

2.11 Today, there are some other local governments, such as the Cities of Kitakyushu, Kawasaki, Osaka, Tokyo, etc., in addition to City of Yokohama, which are proactive in international technical cooperation with cities in emerging nations. There are also some neighbor countries, such as Singapore, which is proactive in promoting its infrastructure technologies and conducting projects in various overseas markets. In this section, we will sort out the assistance by the Cities of Kitakyushu, Osaka and Singapore provided to SMEs seeking for overseas expansion.

2.12 In Kitakyushu City, the City's "International Business Promotion Division", JETRO Kitakyushu and Kitakyushu Foreign Trade Association have jointly established and operate the "Kitakyushu Trade and Investment One-Stop Service Center (KTI Center)." The Center supports both local companies' overseas business expansion and foreign companies that wish to engage in business in Kitakyushu, and has programs as shown in the below table, particularly for assisting SMEs.

Table 2.8 Assistance Program of KTI Center

Program	Details	Type of assistance
1) Supporting project for market studies, etc.	Subsidy for part of the cost on market study such as sales market study and finding of provider of production materials as a part of procurement planning in the region where new expansion of overseas business is expected. Max: 100,000 yen (within 1/2 of the subject expense)	Subsidy for cost (market study)
2) Supporting project for displays at overseas exhibitions	Subsidy for part of the cost required for displaying the companies' own products at an overseas trade fair or exhibition. Max: 300,000 yen (within 1/2 of the subject expense)	Subsidy for cost (display at exhibition)
3) Supporting project for the establishment of overseas office for local business development	Subsidy for part of the cost for the establishment of an overseas office to be jointly used by multiple companies, or the cost for building a production base using an overseas plant for lease. Max: 500,000 yen (office), 1 mil yen (leased plant) (within 1/2 of the subject expense)	Subsidy for cost (establishment of overseas office)
4) International business advisor	Free consultation by specialists with deep understanding of the overseas business	Specialist consultation
5) The Organization for the East Asia Economic Development - One Stop Center	Free consultation, leveraging the Organization's network participated by 10 cities in Japan, China and Korea	Specialist consultation
6) China business support	Market penetration support, leveraging Kitakyushu City's representative offices in Shanghai and Dalian	Specialist consultation
7) Trade promotion loans	Low-interest loan for trade (max: 15 mil yen) or for travelling overseas (max:500,000 yen)	Loans
8) Trade affairs study course	Courses on local legal system, contract/ export-import clearance procedures, English courses	Seminars, study sessions

Source: JICA Study Team from "H25 Chusho-kigyo shien-shisaku katsuyou guidebook (FY13 Guidebook on the application of SME support measures)" by the City of Kitakyushu

2.13 In addition to the above, Kitakyushu has an assistance system on environment, an area which the City had been focusing on after overcoming its own pollution problems, inherent to an industrial zone. The "Kitakyushu Asian Center for Low Carbon Society" is in charge of this system. Kitakyushu City is aiming to establish its brand as "the world's environmental capital" and "Asia's technological capital", and has been selected as a "FutureCity" by the Japanese government, same as Yokohama. The Center is positioned as the central facility for transferring environmental and social technology to the Asian region, promoting Asia's low carbonization and activating regional economy for the realization of the above-mentioned city strategy, and is jointly operated by the City's Office for International Environmental Strategies, Kitakyushu International Techno-cooperative Association (KITA) and Kitakyushu Urban Center of Institute for Global Environmental Strategies (IGES). Details of assistance in overseas expansion by the Center, in particular, for the environmental business, are shown in the below table.

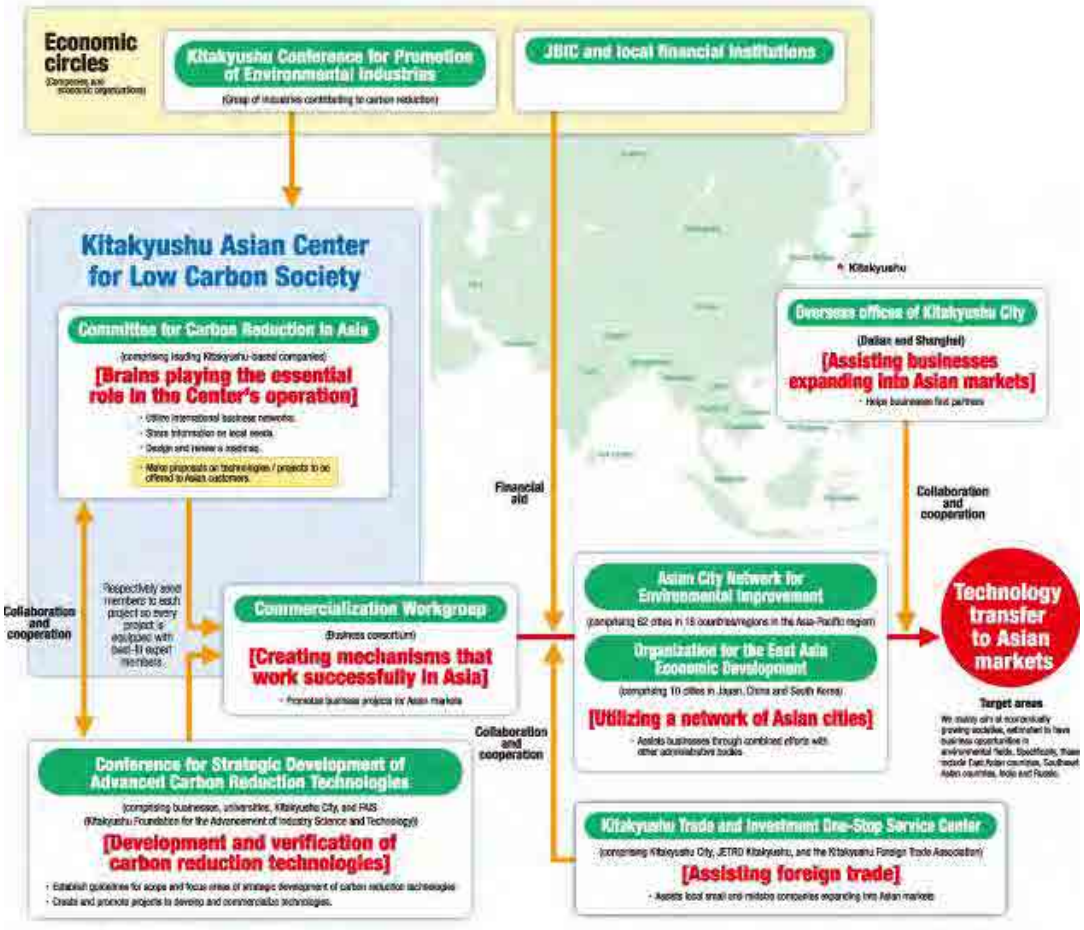
Table 2.9 Assistance provided by the Kitakyushu Asian Center for Low Carbon Society

Program	Details	Type of assistance
1) Verification project support	Subsidy for a part of the cost for localizing existing technology/products to specific overseas countries' needs, or the cost for local verification test. Max: 5 mil yen (within 1/2 of the subject expense)	Subsidy for cost (verification project)
2) FS project support	Subsidy for a part of the cost for conducting a FS on overseas business utilizing existing technology/products to investigate if it could be feasible in the selected country. Max: 2 mil yen (within 1/2 of the subject expense)	Subsidy for cost (FS)
3) "Packaging" of individual technologies	In cases where element technology of each individual company alone cannot meet overseas needs, promote cooperation among companies to support overseas sales promotion, by combining the technology, equipment, products owned by different companies and by adding maintenance services	Partner introduction (domestic)
4) Improvement of technologies/products for meeting the local needs	In case companies are required to improve their technology or products to meet the needs of the Asian cities, introduce research institutions such as universities, or organizations engaged in university-industry cooperation to support the improvement of technology, etc.	Partner introduction (domestic)
5) Marketability study	In case companies need to conduct a study on the applicability or economic performance of their technology or products for transfer to the Asian emerging nations, support such companies through the application of the subsidy system for developing future environmental technologies (Max subsidy for verification study: 10-20 mil yen; max for subsidizing social system study/FS study: 2 mil yen)" which assists domestic technology development experimental study/FS and other supports through satellite offices (e.g. Dalian City)	Subsidy for cost (market study) Information provision
6) Demonstration experiment support	In case companies need to perform a demonstration experiment to confirm the performance and effect of their technology or products in the Asian region, arrange a location for such experiment such as plants, through the administrative agency of cities with which it has a network	Promotion of communication with counterparty government Partner introduction (overseas)
7) Backup for subsidy application	Provide advice when companies are applying for subsidy programs provided by the national government/ relevant organizations such as JETRO or NEDO	Support in application for assistance programs
8) Support in the area of finance/ information	Under the cooperation of JBIC, provide companies with overseas environment related business information, and support the companies' overseas expansion in terms of the necessary funds, in cooperation with regional financial institutions (application of syndicated loans by JBIC and regional financial institutions and trade promotion loans)	Information provision Partner introduction (financial institution)

9)	Business support through overseas offices	For companies considering environmental business expansion in Dalian City or Shanghai City (China), support communication with the local administration and/or the search for a local partner through the City's overseas offices in the 2 cities	Promotion of communication with counterparty government Partner introduction (overseas)
10)	Dispatch of business site visit teams	Regularly dispatch business site visit teams to the Asian region for understanding local needs or providing opportunity for matching them with companies' businesses interest. Carefully follow up on project ideas with high possibility of being realized as a business-to-business transaction in future	Site visit teams
11)	Establishment of business support tools	In order to promote inter-company cooperation, create a database mainly on low carbonization technology, and an business environmental map, including local information and environment-related legal structure in Asian countries/regions, that would be an assistance to companies considering business development in the Asian region	Information provision

Source: JICA Study Team from Kitakyushu Asian Center for Low Carbon Society's website

Figure 2.25 Flow of assistance by the Kitakyushu Asian Center for Low Carbon Society



Source: Kitakyushu Asian Center for Low Carbon Society

2.14 Osaka City has commissioned the support to SMEs to the Osaka Urban Industry Promotion Center through the "Overseas Business Development Initiative (OBDI)." The Center provides assistance as shown in the below table by cooperating with various relevant organizations, such as Kansai Bureau of Economy, Trade and Industry (METI Kansai), JETRO, Organization for Small & Medium Enterprises and Regional Innovation,

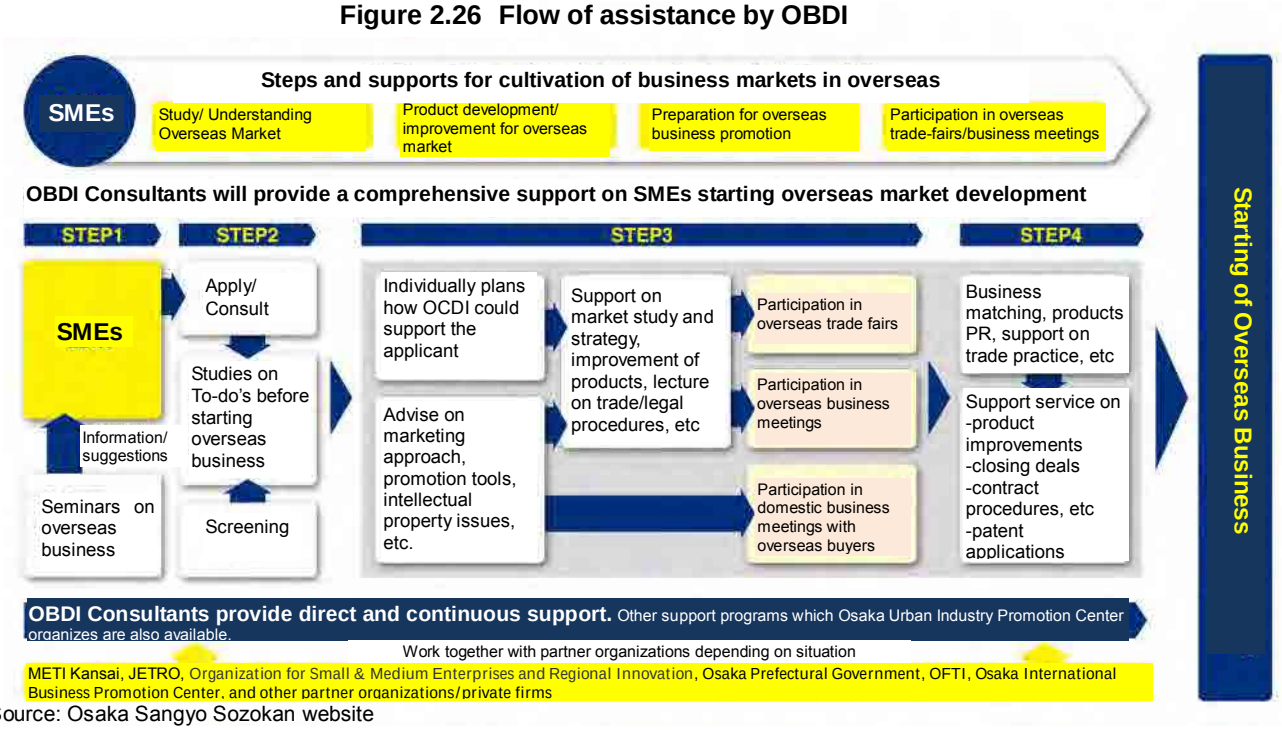
Osaka Prefectural Government, Osaka Foundation for Trade & Industry (OFTI) and Osaka International Business Promotion Center. In the OBDI initiative, individuals that have a detailed knowledge of overseas markets such as those working at or have worked at trading or manufacturing companies, or consultants that act as a "coordinator", would provide a consistent support from advising on the preparation of a plan for overseas market development through successfully concluding business negotiations.

Table 2.10 Assistance Program of Overseas Business Development Initiative (OBDI)

Program	Details	Type of assistance
Advice on planning/ development of overseas markets	・Planning support including selection of destination for penetration, determination of products/ technology for overseas promotion, establishment of internal structure, understanding managerial resources that are available in local market ・Provision of advice on sales/marketing approach, various promotion tools and intellectual property related matters	・Specialist consultation ・Information provision
Coordination of exhibitions and business meetings	・Subsidy for 1/2 the cost for displaying at an overseas trade fair, or 1/2 of the venue for local business meetings (pro rata between participating companies) ・Support in product PR and matching with overseas businesses accompanying the display/participation by OBDI consultant in overseas trade fairs/business meetings ・Free participation in (domestic) business meetings that invite overseas buyers	・Subsidy for cost (display at exhibition) ・Exhibition display support (allocation of specialists) ・Partner introduction (local) ・Holding of business meetings
Trade affairs	・Advice on trade affairs	・Specialist consultation

Source: Source: Prepared by JICA Study Team from "Introduction of the Overseas Business Development Initiative (OBDI)" by OBDI

Figure 2.26 Flow of assistance by OBDI



Source: Osaka Sangyo Sozokan website

2.15 Singapore is actively engaged in urban development projects in foreign countries as well as global export of its infrastructure technologies, including water treatment and environmental technologies, and can be referred to as a representative city in terms of its pioneering initiatives in the area of "export of urban development knowhow and technology." For example, it has collaborated with Suzhou City as well as Tianjin City, China, in development of environmentally friendly, smart city in each city. Also, it holds

large-scaled international events such as the World Cities Summit, inviting leaders from around the world including emerging nations to share the country's advanced technologies and urban planning knowledge, actively promoting the export of its urban development solutions. As initiatives by such advanced cities can be of reference, we decided to review the Government of Singapore's programs on overseas business development assistance for its domestic companies. International Enterprise Singapore (IE Singapore) is the organization in charge of supporting Singaporean companies' globalization and overseas expansion. Specifically, IE Singapore provides a wide range of services as described below, from the provision of information and support in human development, to financial and tax support. It also has offices in 35 countries which provide partnering support and information.

Table 2.11 Assistance Program of IE Singapore

Program	Details	Type of assistance
1 Information provision/consultation support		
1) Provision of various information, consultation	・Advisory center Provide one-stop consultation/information provision services as the companies' initial contact point ・Provision of various reports Provide reports focused on the countries'/regions' markets and industries (IE insights)	・Information provision ・Specialist consultation
2) Holding of seminars and work shops	・Advisory seminar Hold seminars specializing in the countries' market ・Export clinic Hold seminars on trade related skills and systems, such as customs duties ・Market research clinic/workshops Workshop for acquiring knowhow for leveraging the huge data accumulated at the Advisory center	・Seminars, study sessions
3) Networking support with trade related agencies and groups	・Introduce relevant trade related agencies and groups	・Information provision
2 Capability/human development support		
1) Capability development subsidy	・Subsidy for third-party consultant fee of max 50% for capability development in the area of global strategy planning, branding, design, finance, intellectual property, supply chain management	・Subsidy for cost (human development)
2) Various human development programs	・Global HR strategy development program Subsidy for third-party consultant fee of max 50% for establishing a global HR strategy ・Customized training programs Subsidy for third-party consultant fee of max 50% for company training programs customized by specialist training companies based on the business needs and issues of companies ・Global market immersion program A program in which the participant acquires practical knowledge, market approach methodology and various practices from experienced lecturer on each market (lecturer can be selected internally) so that they would actually be relocated to the country/region of the target after taking the courses. Subsidy provided for a part of the expense of the lectures. ・Global business fellow program A short-term program of about 1 week for middle class to executive level staff. Aim is to gather local information and establish business network. Conducted through cooperation between IE Singapore and	・Subsidy for cost (human development) ・Seminars, study sessions

	specialized institutions. Subsidy for 70% of the participation fee (accommodation, airfare, etc. to be borne by the individual)	
3. Market access support		
1) Market access subsidy	Subsidy for max 50% of expense for market research, FS, and starting-up business in new overseas market (selection of exporter/distributor, product listing fee, etc.), overseas office expense, M&A cost, etc.	・Subsidy for cost (market study) ・Subsidy for cost (FS) ・M&A） Subsidy for cost (establishment of overseas base, M&A)
2) Cooperation with trade related agencies and chamber of commerce	・LEAD (Local Enterprise and Association Development) program Support the strengthening of companies' capability in the area of corporate branding, protection of intellectual property, HR management through cooperation with trade related agencies and chamber of commerce. Support for 70% of expense. Subsidy for training of staff at trade related agencies and chamber of commerce, max:90% ・IMAP (International Marketing Activities Programme) Provide companies with business and networking opportunities through events organized by trade related agencies and chamber of commerce such as business site visits and trade fairs. Subsidy for 50% of the subject expense, such as exhibition booth rental fee, through trade related agencies and chamber of commerce	・Subsidy for cost (human development) ・Subsidy for cost (display at exhibition)
3) Cooperation with international agencies	・Singapore cooperates proactively with ADB, IBRD, IFC, IDB and UN for gathering information on infrastructure project opportunities in developing countries identified by international agencies, and for leveraging the relation the agencies have with developing countries' government and various insurance systems. International agencies can assume the role of a facilitator in negotiations on local government projects in countries which are difficult to negotiate individually	・Information provision ・Guarantee system
4) Holding of business forums in countries	・Hold forums specializing in emerging countries, such as the Africa Business Forum	・Seminars, study sessions
4. Finance support		
1) Globalization loan scheme	・A joint loan scheme with financial institutions for overseas fixed asset investments and overseas project loans	・Loans
2) Political risk guarantee	・Subsidy for political risk insurance costs of max 50%	・Subsidy for cost (insurance cost)
3) Loan guarantee scheme	・Subsidy for 50% of guarantee charge with a private insurance company. Loans exceeding the private insurance company's guarantee will be directly guaranteed by IE Singapore	・Subsidy for cost (guarantee charge) ・Guarantee system
4) Trade credit guarantee scheme	・Guarantee for max 50% of insurance cost for insurance on default	・Guarantee system
5. Tax support		
1) Double tax deduction for expense related to overseas business expansion	・Admitted to book as expense when calculating the net taxable amount, the expenses required for overseas expansion (business development, travels for investment study, participation in site visits or in exhibitions or trade fairs, etc.) in double amount	・Tax exception

Source: Prepared by JICA Study Team from IE Singapore website and "CIAIR REPORT No.388 Singapore ni okeru kigyou/ infra no kaigai-tenkai shien-shisaku ～Singapore wo kyoten to shita kaigai-tenkai no kanousei (Measures to Support the Overseas Expansion of Companies and Infrastructure in Singapore – possibility of overseas expansion from Singapore as the base)" by CLAIR (2013.4)

2.16 The below table shows the comparison by type the assistances provided by each player.

Table 2.12 Comparison of Assistance Programs

		Japanese government/relevant agencies, etc	City of Yokohama	City of Kitakyushu	City of Osaka	Singapore
Information gathering/knowledge acquirement		・Information provision ・Seminars/study sessions ・Specialist consultation ・Introduction of projects inquired	・Information provision ・Seminars/study sessions ・Specialist consultation	・Specialist consultation ・Information provision ・Seminars/study sessions	・Specialist consultation ・Information provision ・Seminars/study sessions	・Specialist consultation ・Information provision ・Seminars/study sessions
Participation in exhibitions/business meetings (excluding subsidy for cost)		・Holding of business meetings ・Exhibition display support (joint pavilion, allocation of specialists/interpreters, etc)	・Holding of business meetings ・Exhibition display support (joint pavilion, allocation of specialists)	-	・Holding of business meetings ・Exhibition display support (allocation of specialists)	-
Local visits		・Site visit teams	・Site visit teams	・ Site visit teams	-	-
Partner introduction (domestic)		-	-	・Promotion of academic institutions-industry cooperation for technological improvements ・Partnering support to connect companies with element technology for developing products that meet overseas needs ・Introduction of financial institutions (promote syndicated loans by JBIC and local financial institutions)	-	-
Partner introduction (local)		-	・Support in identifying partner companies through overseas support desk	・Support in identifying partner companies through overseas office	・Business negotiations matching by leveraging exhibitions and business meetings, prior approach before business negotiations by coordinator, etc	-
Promotion of communication with overseas governments		・Request counterparty government for the improvement of administrative procedures using diplomatic establishments abroad, etc (Ministry of Foreign Affairs)	-	・Arrange a project site (e.g. factories, etc) for demonstration experiment, through the governmental agencies of the cities with which the City has a relationship	-	
Subsidy for cost	Market study/strategy development	・The Small and Medium Enterprise Agency : max 5 mil yen (subsidy rate 2/3)	-	・Subsidy max: 100,000 yen (within 1/2 of the subject expense)	-	・Subsidy of max 50% of expense
	Exhibition display	・Organization for Small & Medium Enterprises and Regional Innovation: max 1.2 mil yen (subsidy rate 6/10)	・Max 200,000 yen	・Max 300,000 yen (subsidy rate 1/2)	・Subsidy rate 1/2	・Subsidy rate 1/2
	FS	・Ministry of Foreign Affairs: max 30-50 mil yen ・Organization for Small & Medium Enterprises and Regional Innovation: max around 500,000 yen (subsidy rate 2/3)	-	・Max 2 mil yen (subsidy rate 1/2)	-	・Subsidy of max 50% of expense
	Verification project	・Ministry of Foreign Affairs: max around 100 mil yen	-	・Max 5 mil yen (subsidy rate 1/2)	-	-
	Technology /product development	・The Small and Medium Enterprise Agency (JAPAN brand development support project): max 20 mil yen (subsidy rate 2/3; including exhibition display support) ・The Small and Medium Enterprise Agency (Global technology cooperation support project): max 50 mil yen (subsidy rate 2/3)	-	・Verification study: max 10-20 mil yen (verification study) FS for verification study: max 2 mil yen	-	-

		Japanese government/relevant agencies, etc	City of Yokohama	City of Kitakyushu	City of Osaka	Singapore
Subsidy for cost	Patent application, etc	・Japan Patent Office: max 1.5 mil yen (patent application); 600,000 yen (design, trademark application) (subsidy rate 1/2 for both) ・Subsidy for invasion investigation cost by JETRO: max 3 mil yen (subsidy rate 2/3)	・Max 1.5 mil yen (patent); 600,000 yen (design, trademark) (subsidy rate 1/2)	-	-	-
	Human development/training	・HIDA support for receiving foreign trainees: subsidy rate 2/3 ・HIDA's specialist dispatching support: subsidy rate 3/4 (company to bear 7.5% of total operating cost)	-	-	-	・Subsidy of max 50% for fee on third-party consultant engaged for various capability development ・Development programs held by IE Singapore: subsidy for max 70% of the participation fee ・LEAD programs: subsidy for max 70%
	Establishment of overseas base	-	-	・Max 500,000 yen (office), 1 mil yen (leased plant) (subsidy rate 1/2)	-	・Subsidy rate max 1/2 (overseas office expense, M&A cost, etc)
Financing, insurance		・Loans (loans for start of business/business expansion of overseas affiliate, equipment fund/working capital for overseas business) ・Guarantee system (debt guarantee) ・Trade insurance ・Fund investment	・Loans (equipment fund/working capital) ・Subsidy for cost (subsidy for credit guarantee fee)	・Loans (trade: max 15 mil yen, travel: max 500,000 yen)	-	・Loans (overseas fixed asset investments, overseas project loans)... syndicated loans ・Subsidy for cost (insurance premium, guarantee charge) subsidy rate 1/2 ・Guarantee system ・Tax exception
Nurturing and securing of global (local) human resource		・Seminars/study sessions ・Internship dispatching ・Introduction/acceptance of human resource	-	-	-	・Seminars/study sessions

Source: JICA Study Team

5) Summary on the companies' overseas business expansion

(a) Provision of information, specialist consultation

2.17 The comparison table indicates that local governments also provide information on the local legal system and market environment, and advice and consulting services through specialists with a good understanding of international business. However, at the local government level, these assistance programs focus on the manufacturing industry in many cases, and there is little information on infrastructure projects. In addition to understanding the situation of the subject city's existing infrastructures, an understanding of the local government's needs and plans on the future infrastructure developments is required, as infrastructure business is often controlled by governments and related organizations. Currently, such information is being provided by organizations at the national level, such as JICA.

2.18 Meanwhile, Kitakyushu City has been promoting inter-city cooperation with cities in emerging nations for a long time, such as with Surabaya City in Indonesia, and has gained understanding of the needs of their counterparts through such relationship of mutual trust, and was able to contact and share the information with potentially interested Japanese companies. For example, Nishihara Corporation, a company promoting a pilot project on

the recycle-type intermediate waste disposal and treatment facilities in Surabaya City, was initially reviewing to implement the project in the Special Capital Region of Jakarta, but changed the location to Surabaya, being introduced the city by Kitakyushu's staff. In this way, leveraging inter-city cooperation can lead to overseas expansion by way of dispatching information on business opportunities to companies. Singapore also gathers information on developmental issues and infrastructure needs of cities in developing countries by collaborating with international agencies involved in development assistance for developing countries, for seeking for business development opportunities.

2.19 Yokohama has, as part of the Y-PORT Project, also promoted such cooperation with emerging cities and international agencies in recent years, and executed a memorandum with the cities of Cebu (Philippines), Danang (Vietnam) and Bangkok (Thailand) and international agencies such as JICA and the Asian Development Bank. It has tried having the City's companies participate in joint conferences with the counterparty city and there is a company that has started a F/S in Cebu due to the occasion. The framework signifies that information on developing countries' infrastructure market and opportunities will flow into the City of Yokohama more easily. Utilizing this framework, such structure to ensure any worthwhile information provided from the counterpart cities would be effectively and continuously shared with the companies in Yokohama City.

(b) Introduction of partners

2.20 There are 2 cases in the introduction of partners. One is the introduction of a domestic company that will jointly go abroad, and another is the introduction of an overseas local company that will be a business partner on the site. The latter is being handled by all local governments that have been taken up in this section, but it is only Kitakyushu City that specifically states the introduction of a domestic partner in its assistance program. In particular, the City keeps in mind the needs of the foreign city when introducing a partner, and will connect companies that possess the required element technology for developing the product which is being sought. This is a method of assistance that can only be provided by a local government that understands local needs through inter-city cooperation. Although not clearly mentioned in its assistance program, Yokohama also introduces domestic companies as partners through the Y-PORT project. For example, AMCON, Inc. is using the Ministry of Foreign Affairs' "Overseas Expansion of SMEs and ODA for Developing Countries" to conduct a F/S in Cebu. It applied for this system jointly with a consulting firm introduced by a Y-PORT staff, and was selected.

2.21 As described in the results of hearings on the issues as mentioned above, SMEs possess excellent element technologies, but are at times faced with difficulties in going abroad alone as they specialize in limited technology or products. In future, there could be a form of assistance where local needs are understood through the promotion of inter-city cooperation and domestic companies are provided with recommendation or consulting service by the City for partnering with other companies with relevant technologies/ products with which they could jointly meet the local needs. As IDEC and the City's individual bureaus are aware of the technology and products of the City's companies, further cooperation between them and the Y-PORT could realize an effective support on partnering of companies that responds to developing countries' needs.

2.22 Cooperation between large-sized companies that are ahead in penetrating overseas markets and SMEs with sophisticated element technology can be another possible option. For example, Nagaoka International Corporation, which is a SME based in Osaka that

manufacturers water treatment facilities, established a plant component factory in Dalian, China, in the form of a joint venture with Hitachi Zosen Corporation. Using this factory as a base, the company will locally sell groundwater intake/purification facilities and plant equipment with technology jointly developed with Hitachi Zosen Corporation. This can be regarded as a success case of a SME's overseas infrastructure business realized through cooperation with a large-scaled company. As many of the major companies stated above currently have a cooperation agreement with the City of Yokohama, the City may discuss future cooperation with SMEs with these companies through the framework.

(c) Promotion of communication with overseas governments

2.23 For an infrastructure project, negotiation with the local government will become necessary in many cases, but contacting and negotiating with the appropriate counterparty on the government side could be difficult and time-consuming for the private sector, not limited to SMEs. It is possible to respond to such cases by creating an environment under which it would be easier for companies to make entry, by establishing a relationship of trust with the city in the developing country through "G to G", and by seeking understanding and assistance from the subject city's government officials. For example, in the above-mentioned case of Nishihara Corporation with Kitakyushu City, negotiations with the Special Capital Region of Jakarta did not effectively proceed as it could not contact the appropriate counterparty, but it was able to engage in smooth discussions and negotiations with the government of Surabaya City due to Kitakyushu City's intermediary[4]. Yokohama's Y-PORT is also contributing to smooth communication, by attending the discussions between the Cebu City government and the City's companies that are conducting FS locally, and is expected to promote similar assistance with other cities with which it is cooperating.

2.24 In order to establish a relationship of trust through "G to G", it is important to leverage the relationship with local government staffs that have an understanding towards Japan's attractive infrastructure technology and management capabilities, gained through their visit to Yokohama through JICA's training programs, etc. There are expectations towards effectively making use of such training programs, by creating a database of the past trainees to keep their track after they have returned to their country and having continuous communication with them.

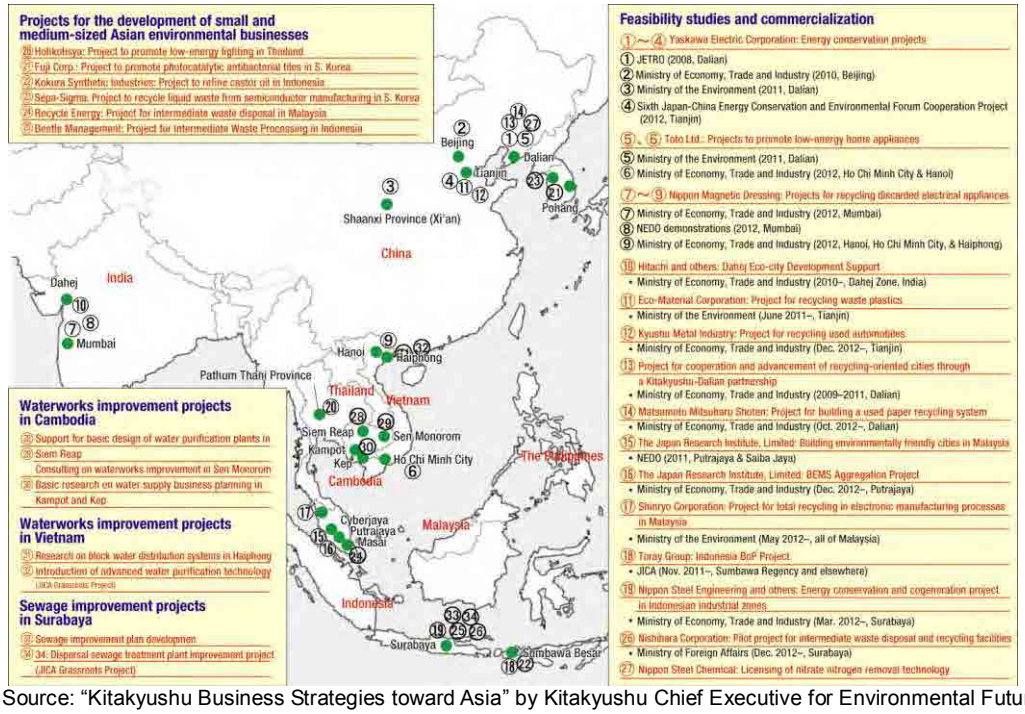
(d) Subsidy for project development costs

2.25 There are various programs provided at the national level to subsidize costs for market studies, F/S, and verification projects. Those referred to above are those in particular for SMEs, but there are other assistance programs by JICA such as for cooperation preparatory studies (PPP infrastructure projects), and also by the Ministry of Economy, Trade and Industry or Ministry of the Environment for projects on low carbonization, such as the Joint Crediting Mechanism. On the other hand, systems to subsidize costs established by municipalities are limited, but in the case of Kitakyushu City, it subsidizes the expense on F/Ss and verification projects mainly on the environment management sector which is the area focused by the City in overseas expansion. Although it is not easy for a local government to provide subsidy due to its budget, there could be room for consideration to provide some kind of subsidy limited to the area of focus, such as in the cased of Kitakyushu.

[4] ISAP 2013 Forum "Possibility of inter-city cooperation for the realization of a low carbon society in Asia: through the case between Kitakyushu City and Surabaya City, Indonesia" Presentation by Nishihara Corporation

2.26 Furthermore, the City of Kitakyushu assists the City's companies when applying for the national government's subsidy programs. According to the City, its staff with deep knowledge on developing countries' needs will cooperate with the companies in writing the proposal. Companies in the City are actually utilizing the various assistance programs offered by the national government as shown below, and conducting a large number of F/Ss. This structure is very much encouraging for companies and even when the local government itself cannot provide a subsidy, it may provide advice and assistance in winning a subsidy from the national government.

Figure 2.27 Overseas projects development by Kitakyushu City



Source: "Kitakyushu Business Strategies toward Asia" by Kitakyushu Chief Executive for Environmental Future City

(e) Nurturing and securing of international human resource

2.27 One of the issues particularly with SMEs is that although the companies have the intention of expanding their business overseas, they lack the so-called global human resource that possess the knowledge and knowhow on the method for gathering information and for approaching foreign markets. Strengthening the abilities of SME employees as global human resource should be promoted as a policy, and the existence of Japan's education programs provided through Organization for Small & Medium Enterprises and Regional Innovation, JETRO and the Economic Affairs Bureau of the City of Yokohama, should be made thoroughly known to companies in the city. Singapore does not only provides education programs through public agencies, but has a subsidy system for trainings provided by private consultants in order to assist the development of global human resource through a wide range of menus, from consulting on developing a global human resource strategy to training programs customized to each company's situation. Yokohama may also provide a wide range of assistance for human development through the use of private training companies and consulting firms.

(4) Experiences and Know-Hows from Urban Development of Yokohama City

1) General

2.142 The consistent policies and approaches of Yokohama for long history of urban development from high economic growth period in the past to mature period at present are summarized as follows: i) establishment of organization and human resource development, ii) strategic project and institutional arrangement, iii) public participation and partnership with private sector, iv) prioritization under constraints of finance and time, v) overseas deployment with public-private-partnership. The tradition and strength of Yokohama is to establish a virtuous circle by collaborating with stakeholders, and generating synergy effects and new potentials in the long-term for tackling with urban issues. In sum, lessons learned from Yokohama, one of major popular cities by collaboration among citizens, governments and private sectors, will be able to contribute to international society as well as developing cities.

2) Establishment of organization and human resource development

2.143 Population of Yokohama City, next to Tokyo was doubled from 1951 (1 mil.) to 1968 (2 mil.) during the period of concentration of population in 1960's. It caused densification of urban center, uncontrolled urban sprawl of sub-urban area, lack of public facilities and infrastructure. To tackle with these issues, Yokohama City restructured organizations and strengthened capacity.

(a) **Organization setup for overall policy implementation:** The mayor at the time, tried to develop a drastic plan for population growth to solve the urban problems. At that time, by appointment and invitation of new personnel, the Planning Coordination Office was established that can demonstrate strong leadership, and to develop strategic policies. Person in charge of each department gathered, free policy debate have been made, and recommended policy decisions while sharing information with each department, cooperation of each department came to be carried out smoothly here. The Planning Coordination Office coordinated and gathered opinions of each department, and reflected to policies by adjusting the compartmentalized public administration from a broad perspective.

(b) **Open positions to persons of talent:** The Urban Design Office was established by facilitating the use of various human resources of talents. This unit was the forerunner shown the need for urban design in the urban planning of the municipality at the time. It is noteworthy that recruitment from the private sector was very rare at that time.

(c) **Public participation to policy making process:** The long-term plan in Yokohama proposed in 1960's was spectacular, innovative based on quality of life of citizens. The long-term plan which the City Council proposed required enormous budget, so it was rejected initially. However, the City Mayor held a dialogue meeting with citizens to explain necessity of a long-term plan and to deepen the understanding of citizens. Later, this meeting was called the 10,000 citizen meeting. Overall approval process of planning based on understanding of citizens triggered public participation system in the administration mechanism of the city. Continuous efforts of both government and citizens to deepen understanding and share roles are significant.

3) Strategic project and institutional arrangement

2.144 As a matter of rapid population growth city, various urban problems were occurred, for example: traffic congestion caused by through traffic of heavy vehicles in city center,

stagnation in the city center function, sprawl of residential development in the suburbs, the growing reliance on Tokyo, worsening of the living environment by delaying of development of schools and infrastructure due to population growth, etc. In order to address issues over the multifaceted these, because they cannot be addressed by a single project, an institutional system to envision projects comprehensively was established.

(a) **Accumulation of know-how of city center development:** At the time, the main facilities of the city center were requisitioned by the occupation forces after the war, and private sectors were moved out from the city center. To promote the redevelopment of the inner city for the introduction of new urban functions as the city center enhancement measures that will drive the growth of Yokohama. Therefore, in order to take transfer measures shipyard of coastal areas adjacent to the city center, the relocation measures for small and medium-sized factory in the city center , to start the landfill business of Kanazawa District as a new urban redevelopment sites, shipyards, small and medium-sized factory in the city were transferred. Vacant lands after moving out were utilized for urban redevelopment sites. It was decided that the shipyard land would be developed as MM21 planning area together with the landfill planning of coastal areas. On the other hand, in order to prevent the sprawl of housing development in the suburbs and to ensure the city develop a certain level, Kohoku New Town development project was launched. The development standard of this new town was standardized for other development areas by private sectors. The accumulated experiences of basic know-how of urban development, including CBD, industrial park, new town, etc. which can be shared to developing cities.

(b) **Transport infrastructure development to formulate urban structure:** In order to enhance the access conditions and communicate among these 3 centers above, arterial traffic infrastructure development was proposed. The first was a highway development for bypassing of large vehicles from the city center. The second was development of the subway for connecting the inner city and suburban areas such as Kohoku New Town. The third was development of the Bay Bridge, which was separated from the inner city logistics transportation, as well as a symbol of Yokohama Port. It is significant to initiate major transport infrastructure to formulate urban structure in the early stage of urban development by collaboration with central government and private sectors, to promote transport infrastructure development from viewpoint of overall socio-economic development in long-term.

(c) **Application of institutional system of urban planning:** Yokohama City formulated and operated original institutional systems which supplies national legal systems to promote strategic projects. From the need in accordance with the revision of the City Planning Law, to preserve green space in the city, Yokohama designated extensive areas as the urbanization control areas.

(d) **Establishment of original regulations for control urban development:** Regard to the development of public facilities such as schools for the growing population, the development guidelines for determining the developer burden, and promote the development of public facilities were formulated. Further, in built-up areas, and further provides an incentive for the height limit on the private land, thereby securing the open space as a public open space. Thus, among the financial resources of local governments with limited, in order to ensure an appropriate public land and public facilities, a system to be a carrot and stick to the private sector was established.

4) Public participation and private partnership

2.145 To promote their own projects in the high-growth period, Yokohama City has worked with national governments, private sectors and citizens. And now, citizens and the private sector become the leading role of urban development, and provide opportunities for participation in various opportunities, while the city works as a facilitator. This is based on the spirit of public participation has been cultivated since the days of the 6 major projects, but it becomes more efficient financial resources and public service delivery for government, encourage community participation of citizens, even innovation of the private sector are connected.

a. **Operation of Community Development Council:** Regard to the development of Kohoku New Town, by organizing the community development council participating of residents, developers and the local government, the residents opinion was reflected to the project planning and implementation. Kohoku New Town Development Council has also become a pioneer that developed the town planning guidelines in regard to the administration of the city.

b. **Rules based on Guidelines:** The outcomes of the council were compiled into the guideline with institutional arrangements to support resident's activities, which contribute to realization of city policies. Activities of these councils were expanded to other areas. These guidelines are not compulsory but suggestions as a part of community, including rules of urban development, landscape, and roles of citizens and private sectors working with governments.

c. **Public facility development by private sectors:** The "land development guidelines" which requires for private sectors to develop public facilities and spaces for developing good living environment were disseminated to other areas, as well as the publicity of private developers were promoted. It is significant that private sectors owe responsibility to develop public facilities which the local government cannot finance enough, and contribute to name recognition of developers at the same time.

d. **Technical innovation with city's initiatives:** At a time when pollution was a serious problem, for the first time in the environmental standards established in the country, Yokohama City entered into with the private sector to "pollution prevention agreements". Strict quota was imposed on the environmental standards by this company, but the innovation of equipment and facilities companies advanced on the other hand is also true. At present, the fact that efforts to Smart City, Yokohama listed the initiative of "Environmental FutureCity", several companies are working on technology innovation. In this way, is noteworthy that up to the present from the high-growth period, and has been working the public and private sectors work together, the urban development-friendly environment.

5) Prioritization under constraints of finance and time

2.146 Yokohama City has promoted urban development under restrictions of finance and time. Lessons learned from their experiences are: i) to concentrate investment to projects with economic impacts, ii) to reduce burdens of local government by sharing financial resources of national governments and private sectors, iii) to make consensus building in early stage not to prolong project implementation periods and reduce effectiveness of development.

a. **Financing of infrastructure development:** 6 major projects were impossible in the scale of financial resources Yokohama. For this reason, it was examined that

cooperation with national projects and utilization of private funds. Kohoku New Town and MM21 projects were implemented by the urban development corporation. Reclamation of Kanazawa Project was implemented as landfill project, and financed by German bonds which were repaid by land selling after development. In case of highway development, it was developed by the Public Highway Corporation which utilized national subsidy. The Yokohama Municipal Subway is operated as a public company, and its operating income is surplus. Recently, Minato Mirai 21 Line was developed by Yokohama Minatomirai Railway Company which is the joint public-private enterprise, and operation is entrusted to Tokyu Corporation, the private sector. In case of pilot projects of FutureCity, with initiatives by the City of Yokohama, it was operated by using national subsidies and private finance. For this, the city concentrated investments to strategic projects by utilizing various financial resources.

b. **Reduction of financial burden of municipality:** As mentioned above, the City of Yokohama utilized subsidies and bonds for financing and required private sectors to develop public facilities to reduce burdens of the city government, so the city could concentrate on investing necessary infrastructure to directly serve for improvement of living environment for citizens. At present, the city has continued efforts to utilize subsidies for YSCP, private finances by PFI and naming rights, to ease financial burdens. Public-private partnership mechanism contributes to ease financial burdens of the city as well as to give opportunities to private sectors for public service provision as business.

c. **Consensus building for increasing development effectiveness:** If the project is prolonged, financial difficulties or misalignment of needs and, due to changes in the relationship with stakeholders, the development effect is reduced. Therefore, from the stage of the project before the decision, and have been working on consensus of stakeholders, such as landowners. Process of public participation are popular in general at present, but in the era of high economic growth period when private operators had been rapidly promoted the residential land development, establishment of the Town Planning Council of Kohoku New Town for consensus building among stakeholders was a milestone for public participation mechanism at present.

6) International cooperation and business based on experiences of urban development

2.147 In recent years, Yokohama City continues a new innovation to actively promote urban development that takes advantage of their own know-how and technology in developing cities. Has experiences of technical cooperation and visit receiving and dispatch of experts, such as through the CITYNET and JICA programs in the field of international cooperation already, but overseas business promotion has been continued further. Y-PORT project was launched for go beyond only intergovernmental cooperation, to promote international business cooperation such as information sharing and business promotion activities, etc.

2.148 Yokohama's experiences are consolidated into coordination of urban development and management by local government, and superior technologies and know-how possessed by the city companies. The city companies, mainly in small and medium-sized enterprises, faces difficulty of the procedure lack of information and coordination skills with developing cities externally, and lack of funds and opportunities to promote their business internally. Progress in cooperation with such as Y-PORT activities is highly expected to provide opportunities private sectors and citizens for business and international cooperation.

3. Present Condition and Development Issues of Target Cities

(1) Present Condition and Issues of Da Nang City

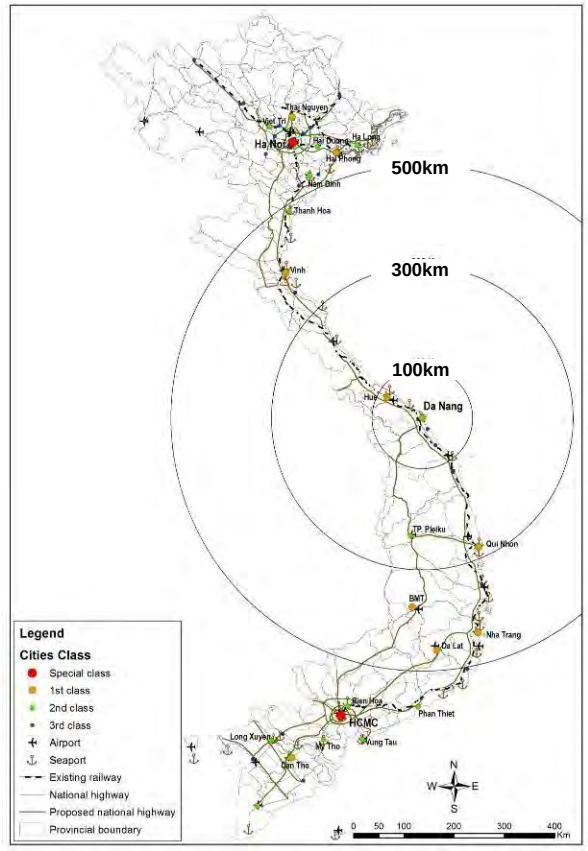
1) Location

3.1 Da Nang City is the center of economy and culture in Central Vietnam. It is located in 964km from Ho Chi Minh City -based city of 764km, in the south from Hanoi, the capital base in the north among the national land long from north to south, as a main north-south integration socio-economic development of Vietnam progresses role has come to be expected more and more. It has served as a trading center for the central region harbor is developed for a long time, its strategic importance is growing rapidly as the gateway of the East-West corridor responsible for the development Greater Mekong Subregion of (GMS) economic zone at the same time. Development of airway also is progressing In addition, Bangkok, Kuala Lumpur, Singapore, Manila, Taiwan, Guangzhou, Hong Kong, Nanning, the growth centers of regions such as Okinawa is located in the 1,000 km-2,000km radius further from , be further enhanced is expected to base its properties. Da Nang City are in close proximity (Complex of Hue Monuments, Hoi An Ancient Town, My Son Sanctuary) to the world cultural heritages, history and culture, tourism resources is also a rich land .

Figure 3.1 Location of Da Nang City in GMS Economic Zone

Source: JICA Study Team

Figure 3.2 Location of Da Nang City in Vietnam



Source: JICA Study Team

Figure 3.3 Location of Da Nang City in Central Region

Source: JICA Study Team

2) History

3.2 Da Nang City was a small transit port in the mid of 16th century, and promoted as a center of regional trading in the beginning of 20th century. Da Nang was a site of a hard-fought battle during the Vietnam War (1960-1975), and attained independent in 1975. Reconstruction of the city was started from 1986 mainly, and the city has grown rapidly. Da Nang City was segmented from Quang Nam Province in 1996, and the city established a role of the center of Central Focal Economic Zone (CFEZ). In 2011, Da Nang City was received the ASEAN Environmentally Sustainable Cities Award.

Table 3.1 History of Da Nang City

Period	History
Mid of 16th Century	Promoted as a small transit port
Early 18th Century	Promoted as a commercial port in place to Hoi An
1835	Hang Port was designated as a trading port of central region
1889	Vietnam was under administration of French Government Da Nang was segmented from Quang Nam Province
Early 20th Century	Major trading port of central region
1967	Da Nang was designated as municipality of Vietnam
1975	End of Vietnam War and independent
1986	Started reconstruction
1996	Da Nang was designated as municipality of Vietnam Da Nang was segmented from Quang Nam Province

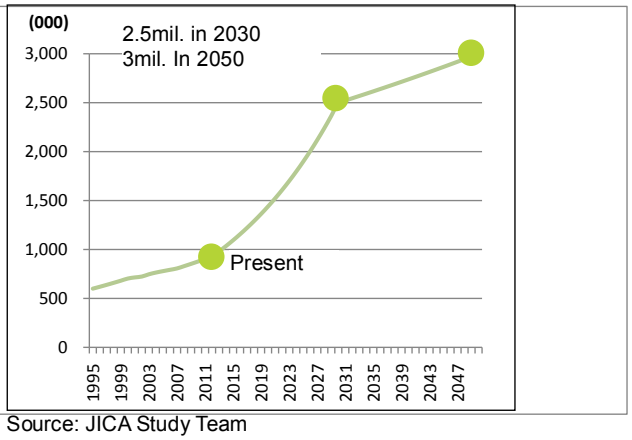
Source: http://www.danang.gov.vn

Table 3.2 Major Indicators of Da Nang City

Indicator			Year 2012
Area (km^2)			1,283
Population	000		928
	Annual growth (%)		2.8 ('00-'10)
	Share of over age 65 (%)		7.1 ('08)
Economy	GRDP (mil. US$)		2,236
	Annual growth (%)		9
	GRDP per capita (US$)		2,310
Social	Poverty rate (%)		2.0 ('08)
	Jobless rate (%)		4.9 ('06)
	Literacy rate (%)		94% (national)
Infrastructure	Modal share of public transport (%)		0.2 (bus, '08)
	No. of vehicles (000)		682 (as of M/C 94.1%)
	Coverage (%)	Water supply	60.9 ('08)
		Solid waste collection	51.6 ('08)
	Price	Public transport	5,000 VND (bus)
		Power	1,350VND/kW (-100kw)
		Water	
		Gasoline	22,900 VND/ liter (A92)
Environment	Hazard risk		15% area flood prone
	Green coverage (%)		17.6 ('08)
Finance	Revenue (mil. US$)	Central budget	12.1 ('08)
		City budget	331.4 ('08)
	Expenditure (share of investment, %)		80% ('08)

Source: JICA Study Team

Figure 3.4 Population Forecast of Da Nang City



Source: JICA Study Team

3) Socio-Economic Condition

(1) Population

3.3 Da Nang City includes 7 districts and 56 communes. Population of Da Nang City has been increased with urbanization trend, and it is reached to 928,000 in 2012. The population growth rate from 2005 to 2010 is 3.2%/yr. The population growth rate is low in built-up area in the city center while peri-urban areas are relatively high, where urbanization areas have been expanded.

3.4 If urbanization trend has been kept, Da Nang City will face similar urban problems (traffic congestion, urban sprawl, lack of housings for low and middle income groups, deterioration of living environment, worsening of urban landscape, expansion of income gap, etc.), same as HCMC and Hanoi City.

(2) Socio-Economy

3.5 High economic growth has been kept, which the GDP growth rate was 10.6% (2005-2010) and reached to 12.6% in 2012. GDP per capita was increased from US$950 in 2005 to US$2,310 in 2010. Economic sector of Da Nang City is promoted by stable expansion of 2nd industry and growth of tourism sector of 3rd industry. In addition, a role of FDI is significant. Foreign investment projects to Da Nang City are mostly real estate projects such as offices, high-rise apartments and resorts, which compose 83% in total.

3.6 While Da Nang City is recognized as an attractive investment environment, amount of FDI has drastically decreased because of international economic depression. This

recent economic crisis is more serious than the Asian economic crisis in 1998, and income tax in 2013 will be less than half of 2010. Investment was very active because of resort development, but after completion of land selling, revenue of the city has been limited.

3.7 Future vision of Da Nang City is to promote IT-based industrial development, and the High-tech Park has been developed. Many Japanese affiliated firms have promoted business in existing industrial zones which contribute to employment generation of the city and surrounding areas. On the contrary, these firms told one of major issues of Da Nang city is lack of human resources of manager class, and lack of capacity of engineers.

4) Landuse

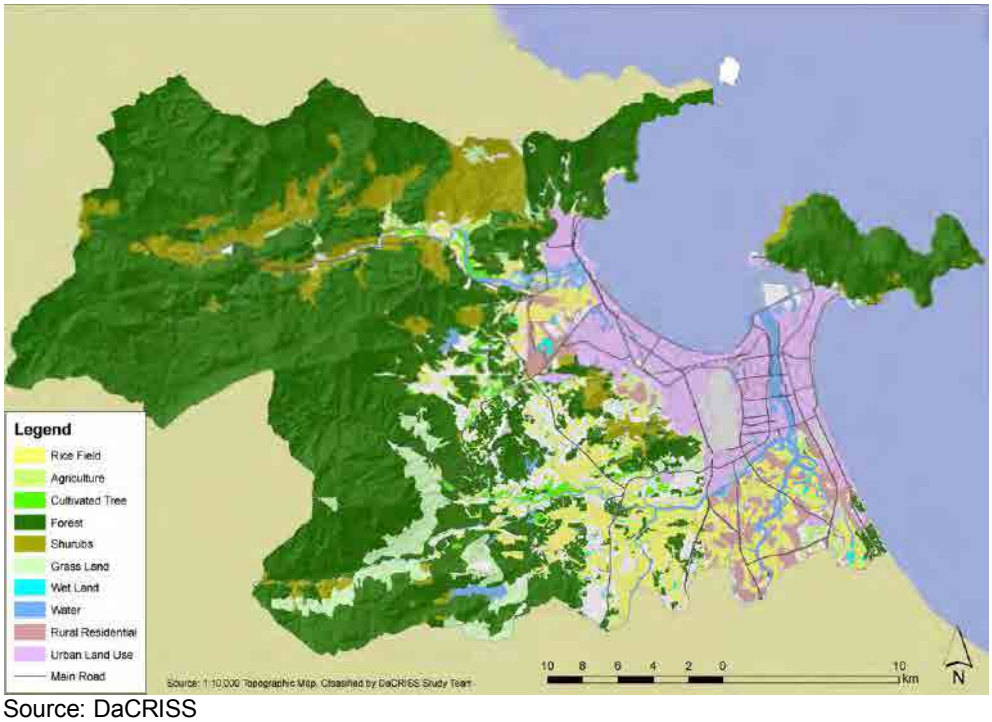
3.8 The area of Da Nang City is 1,256km2 (950 km2 excluding islands). Most of land in the west of the city is covered by mountainous rural areas, while urbanization areas have been developed eastern side along the East China Sea. Development potential area is 341km2 (excluding rivers, lakes, forests, airports, ports, army lands, cemeteries).

3.9 Da Nang City is covered with mountains and forest area, which account for about 60% of the city limits and north-west of the city. Long beautiful sandy beach followed by the South China Sea is spread, the east has become an important tourism resources. Lakes and rivers connect mountains and sea. The openspace reaches 28% of total landuse.

3.10 Urbanized land use is limited to 10%, and the city is composed by compact urban areas with high population density and scattered rural areas. On the contrary, urbanization trend has been rapidly spread to sub-urban areas, especially toward south and south-west directions.

3.11 In the north of the city, Industrial Zones are developed where many Japanese-affiliated firms have established. Along the sea, there are many exclusive resort development areas of foreign investment or Vietnamese investment.

Figure 3.5 Land Use Plan of Da Nang City (2006)



Source: DaCRISS

5) Transport

(1) Road Transport

3.12 Except for the old town east side of the airport, the trunk road network are spread connecting to the north, south, east and west. In addition, there are collector roads with 2 lanes and sidewalks in the old town. Road extension rate of the city is 3.98km/km2 and road coverage ratio is 6.41% (13.58m2/capita), which are relatively good condition.

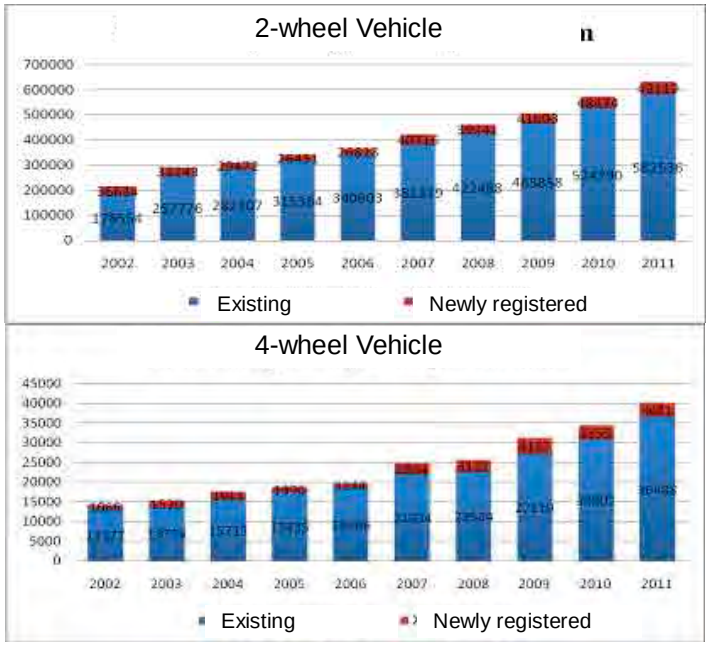
3.13 There are total of five bridges including two bridges under construction in the interval of about 5km from the mouth of Han River. In case of Cam Ly River, there are 3 bridges including 1 which is under construction. There are new bridge construction plans, so it is said that capacity to cross rivers are sufficient.

3.14 Roads of the city center are wide with enough lanes, so accessibility from the city center is relatively good to connect industrial zones, logistic centers, new residential areas along the sea and the south of the city.

3.15 More than 90% of road transport is composed by 2-wheel vehicles in 2012, as of 78% is motorbike and 12% is bicycle. While number of registered 2-wheel vehicles is more than 580,000, number of registered 4-wheel vehicles is only 6%, about 36,000. Number of registered vehicles has been rapidly increased, which is more than double compared to year 2005.

3.16 Traffic environment is relatively good at present. Traffic congestion and lack of pedestrian space are seen in the old town, but there are no serious traffic problems.

Figure 3.6 Number of Registered Vehicle in Da Nang City



Source: DOT of Da Nang City

Figure 3.7 Road and Bridge in Da Nang City

Source: JICA Study Team

(2) Public Transport

3.17 Major public transport mode is bus. The modal share of bus in Da Nang City is only 0.9%, which is very low compared with 14% in case of Hanoi City. The bus network of the city center is 0.222km/km2, which is lower than 4km/km2 in Hanoi City. The average interval between bus stops is about 2.5km, so dense bus service is not provided.

3.18 There are 5 bus routes with 90 buses, but inner-city bus service is limited to route 2, and other 4 routes are inter-city service connecting to sub-urban areas. There are overlapped bus routes, so bus service coverage is limited.

3.19 Number of bus passengers is app. 15,000 per day. While public transport service has not been developed, number of passengers has been stably increased in line with population increase.

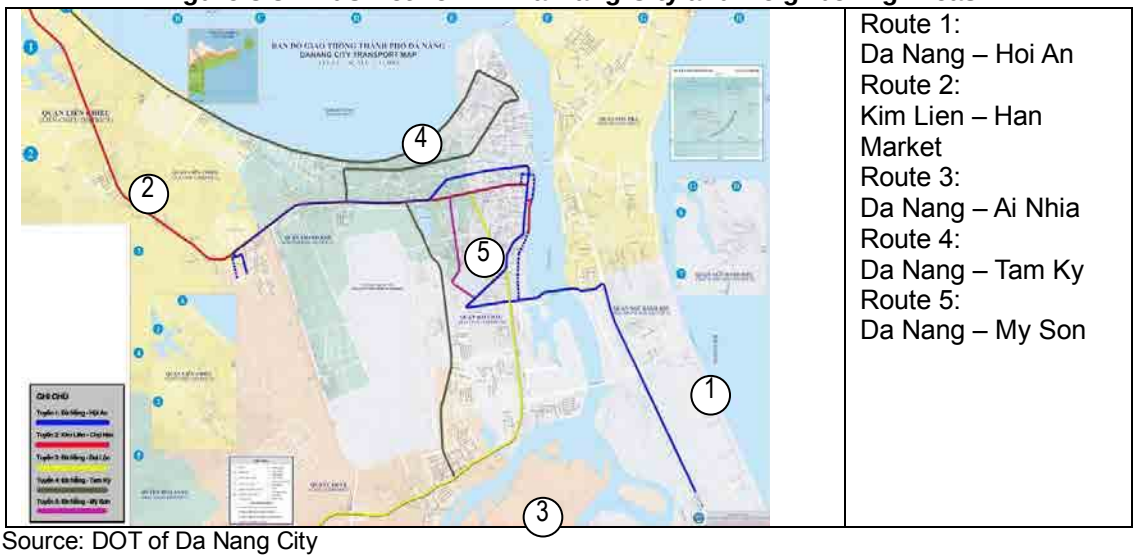
3.20 Da Nang City owns bus and makes contracts with bus operators for operation and maintenance. Bus operators are private sectors excluding route 2. Regardless of distance, bus fare is flat for each route. According to Department of Transport, bus operation is profitable and there are no subsidies from the government.

(3) Railway

3.21 Da Nang is located in the middle of Vietnam South-North Railway connecting between Hanoi and HCMC. Da Nang Station is located in the city center, 2.8km far from Tam Ky Station. From Tam Ky Station to next stations is app. 10km far.

3.22 From Da Nang Station, it takes 17hours to HCMC (935km far), 9.5hours to Nha Trang (523km), 2.5hours to Hue (103km) and 16hours to Hanoi (791km).

Figure 3.8 Bus Network in Da Nang City and Neighboring Areas



Source: DOT of Da Nang City

6) Port

(1) Overview of Danang Port

3.23 Danang Port is a major port located in the central region of Vietnam, and is the third largest port after Saigon and Hai Phong Ports. The port is at the starting point of the East-West Economic Corridor (Danang-Laos-Thailand-Myanmar), and is expected to become a logistics hub in future.

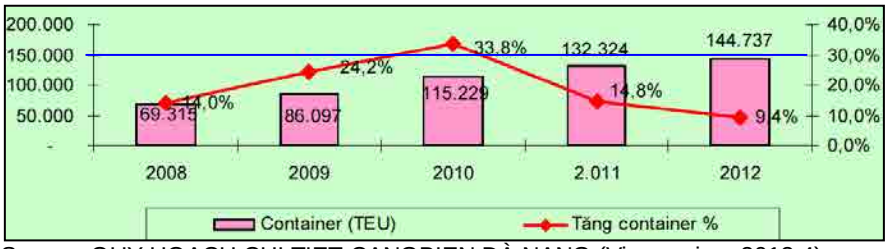
3.24 Danang Port consists of 3 ports which are Song Han Port that was constructed along the Han River when under the era of the French rule, Tien Sa Port that was built by the US military as a military port during the Vietnam War, and Lien Chieu Port, a private port located near Hai Van Mountain Path. Song Han Port has stopped handling cargo and is now a passenger port. Tien Sa Port can accommodate both cargos and passengers. There is only private berth at Lien Chieu Port.

Figure 3.9 Area around Danang Port and photographs of the present state

Source: "DANANG PORT An Ideal destination for ships" (Brochure provided by Danang Port Holdings Limited Liability Company)

3.25 Containers, wood chip, general merchandise, and passengers are mainly being handled at Danang Port. The annual container throughput is 140,000 TEU. The volume of container being handled has more than doubled during the past 5 years, and is nearing the port's capacity of 150,000TEU. It also receives about 60-70 passenger vessels, annually.

Figure 3.10 Transition in the volume of containers handled at Danang Port



Source: QUY HOACH CHI TIET CANGBIEN ĐÀ NANG (Vinamarine, 2013.4)

Table 3.3 Outline of Danang Port's infrastructure

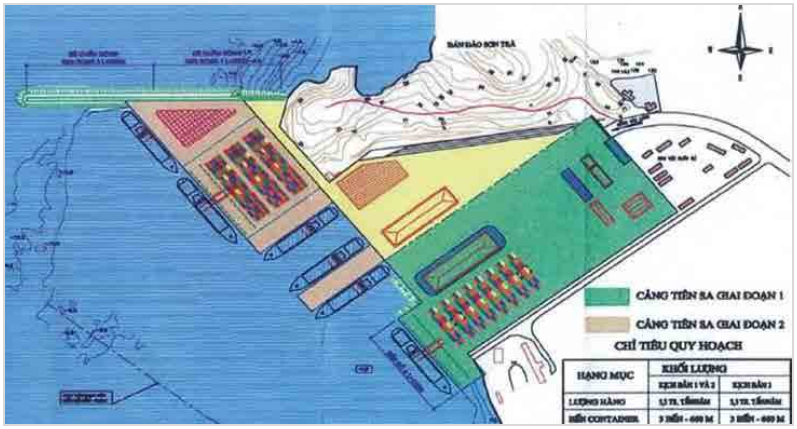
Total area	305,706 sqm
Yard area	230,338 sqm
Warehouse area	29,428 sqm
Quay	10 (total length 1,493m)
Maximum berth depth	-12m
Breakwater	450m
Facilities	Gantry crane x2 (36MT/ 50MT) RTG (Rubber Tired Gantry Crane) x2, shore crane x2, reach stacker x3, clamp loader x2, mobile crane x25, fork lift x32, tractor/dump truck x32, tugboat x7, CFS (Container Freight Station) x1, reefer plug x75

Source: "DANANG PORT An Ideal destination for ships" (Brochure made available by Danang Port Holdings Limited Liability Company)

3.26 Volume of cargo handled at Tien Sa Port is increasing yearly, and is expected to exceed its capacity of 150,000 TEU. The target is 250,000 TEU for 2015 and 600,000 TEU for 2020, and the expansion of Tien Sa Port and new development of Lien Chieu Port are currently being planned. Lien Chieu Port's plan is still at the conceptual stage, both in terms of use and scale, while the study on project development for the expansion of Tien

Sa Port has already started as of April 2013 by local consultants, and an application for a Japanese ODA is planned following the study. Tien Sa Port after the expansion is completed, is planned to be able to receive vessels of 50,000DWT class and container ships of 3,000TEU class.

Figure 3.11 Expansion Plan for Tien Sa Port



Source: "DANANG PORT An Ideal destination for ships" (Brochure made available by Danang Port Holdings Limited Liability Company)

3.27 Furthermore, the introduction of the NACCS or Nippon Automated Cargo Clearance System is being planned to be introduced nationwide in Vietnam (study being conducted as of April 2012, JICA's grant aid).

(2) Stakeholders of Danang Port

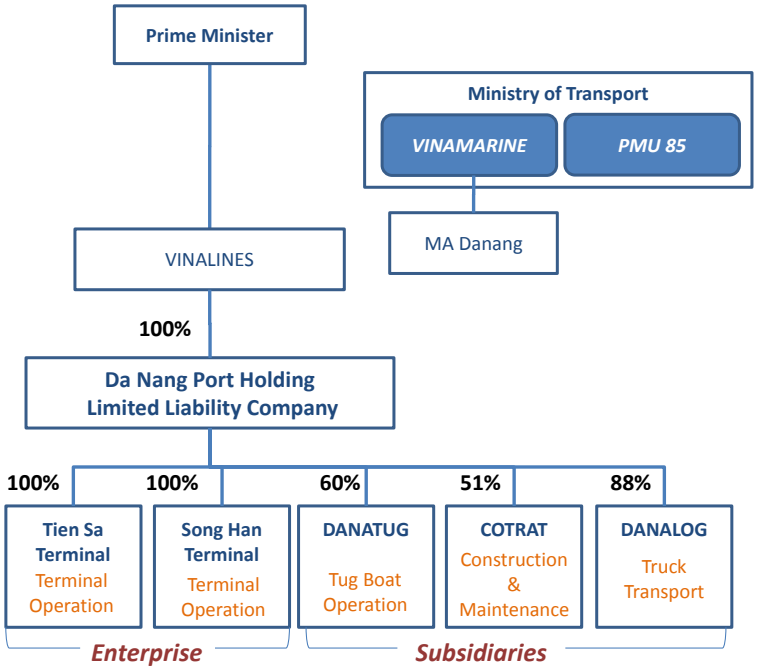
3.28 Da Nang Port Holding Limited Liability Company, a 100% subsidiary of Vinalines, a state-run port management and ship operating company, operates Danang Port, and the development of the new port is to be handled by PMU85, an organization under the Ministry of Transport. The Ministry of Transport, Vinamarine, manages the safety of navigation. There is no so-called port authority that supervises the overall port area.

Table 3.4 Stakeholders of Danang Port

VINAMARINE	Vietnam Maritime Administration. A member of the IMO and responsible for securing maritime traffic safety and developing related regulations and guidelines. MA DaNang is VINAMARINE's local representative office.
PMU85	Project Management Unit. Responsible for port infrastructure development projects (infrastructure such as the quay, breakwater) at the port (Danang Port procures facilities such as cranes).
VINALINES	State-run company with 3 business blocks, including 1) port terminal operation, 2) ship operation, and 3) logistics
DaNang Port Holding Limited Liability Company	Operator of Danang Port
Major shipping companies	Yang Ming, Wan Hai, Gemadept and Maersk account for 80% of freight handled at Danang Port

Source: JICA Study Team

Figure 3.12 Chart on parties related to Danang Port



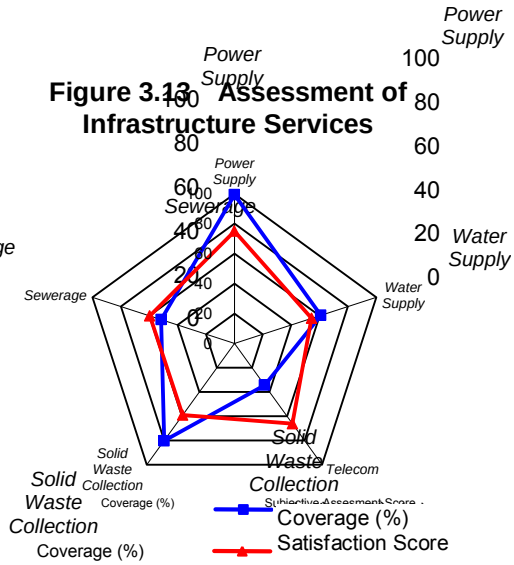
Note) Enterprise: 100% subsidiary; Subsidiaries: subsidiaries with less than 100% investment
Source: JICA Study Team

7) Infrastructure

(1) General

3.29 Infrastructure (power, water supply, sewage and solid waste) is a relatively developed in urban areas, excluding sewerage, but coverage in suburban and rural areas are low. Though the infrastructure is developed, the service quality is low in many places. The figure on the right shows a comparison of objective evaluation (coverage), subjective evaluation (people's assessment). In addition to low service quality, maintenance and repair of facilities, environmental management (water resource management, treatment of industrial pollution, treatment of industrial and medical waste, etc.) is also a major issue.

Figure 3.13 Assessment of Infrastructure Services



(2) Water Supply

(i) Current Situation

3.30 Danang city has two water systems, water supply system in urban area and well system in suburban areas. Water supply system in urban area is constructed by DOC [Dept. of Construction] and operated by DAWACO. Well system in suburban area is managed by DARD [Dept. of Agriculture and Rural Development].

3.31 According to DaCRISS, coverage ratio of water supply system was 56.9% (94,000 households) as of 2007 even though past SEDP [Socio Economic Development Plan] had set a goal in which 100% of urban population and 90% of Suburban population will access to clean water by 2015. Especially, water supply program in rural area implemented by

DARD had achieved coverage ratio only 18% of target area population. In 2007, average water supply volume was 22,500 m^3/day and water demand per capita was 118 Litter/day.

Table3.5 Outline of Water Supply in Danang City

Items	Present Status	Note
(1) Start of Operation	Year 1967	
(2) Service Population	737,759 Persons	Rate of service pervasion 83 %
(3) Water Supply Volume	156,970 m^3/day	
(4) Water Resource	Surface Water (River Water)	Cau Do River, Han River, Tuy Loan River, Yen River, Vu Gia River, Cu De River, South & North River
(5) Rate of NRW	21 %	Non Revenue Water including leakage

Source: JICA Study Team

(ii) Water Resources

3.32 Danang city has a lot of rivers with its tributary such as Cau Do, Tuy Loan, Ten, Nam and Bac River which flow into Danang bay. Main water resource of water supply system is the Cau Do River which flows in southern part of the city. Intake point is located in 15km upstream from river mouth and there is salination problem in dry season. Meanwhile, Son Tra-1 and 2 WTP take raw water from stream in Son Tra peninsula. This stream is not affected by saline water but has not enough potential as water resource for all-year intake.

3.33 As regards ground water potential, DaCRISS reported that capacity of ground water is 6,550 m^3/day and 54% of that are used for water supply. However, due to water quality problem, it will be not available for water resource in the long term.

(iii) Water Supply system

3.34 Diagram of water supply system in Da Nang City is as follows.

Figure3.14 Diagram of water supply system in Da Nang City

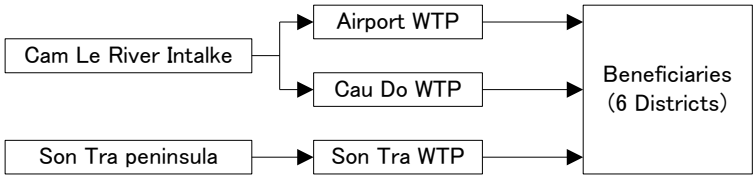


Table3.6 Water Treatment Plant in Danang city

Name of Plant	Capacity (m3/day)		Water Resource
	Design	Actual	
1. Cau De WTP (Old)	50,000	Temporary halted	Cam Le River
2. Cau De WTP (New)	120,000	89,000	Cam Le River
3. Airport WTP	30,000	35,000	Cam Le River
4. Son Tra WTP	5,000	4,000	Son Tra Peninsula
Total	205,000	128,000	

Source: DaCRISS

3.35 In DaCRISS report, distribution network is summarized below.

- Class I (DN>200mm): 262 km
- Class II (DN=100 – 200 mm): 263 km
- Class III (DN<100 mm): 2,021 km, Service Pipe: 951 km

3.36 On the one hand, amended M/P shows outline of distribution network as follows and leakage rate as of December 2010 is 24%.

- Main Trunk (Primary) : Dia300 ~ 1200、Total Length = 284.3km
- Sub Trunk (Secondary): Dia150 ~ 250 [Connection from big scale residence]
- Total Length L=258.8km
- Branch (Tertiary): Dia<100 mm, Total Length = 3.329km

3.37 Water supply system includes two pumping stations, DT 602 and Son Tra PS, for water distribution to urban area and distribution reservoir at Son Tra peninsula. At many suburban areas in Hoa Vang District, even though there is small scale WTP with capacity 2,400 m^3/d, well water is used preferentially.

(iv) Operation and Maintenance

3.38 DAWACO is struggling to reduce high leakage rate by installation of flow meter to control water distribution. DaCRISS report additionally pointed out old pipe should be replaced immediately. Holland Gov. supported DAWACO by technical assistant program, which includes improvement of facility operation for customer service satisfaction and staff capacity building for reduction of NRW, started from 2007. In this program, DAWACO worked on improvement of distribution efficiency through USP (Utility Service Program) and achieved to reduce NRW rate from 40% to 36% in a year.

(3) Sewerage

(i) Current Situation

3.39 According to “Guideline of urban drainage and sewerage development to 2020”, Viet Nam government set a goal as national target to improve coverage ratio of urban drainage and sewerage system with adequate technology from 50-60% to 90% by 2010 in principal cities. Under this strategy, Danang city, which is fourth city in Viet Nam, formulates “The plan for Developing Danang-The Environmental City” in which 1) coverage ratio of industrial wastewater up to 30% and domestic wastewater up to 70% by 2010, 2) coverage ratio of industrial wastewater and domestic wastewater up to 90% by 2015, 3) coverage ratio of industrial wastewater and domestic wastewater up to 100% by 2020, should be achieved. However, the target of 2010 has not been achieved at present yet.

3.40 Sewerage system in Danang city is basically combined system. Wastewater and storm water are collected together. Collected wastewater is separated at diversion chamber before discharge to canal and pumped up to wastewater treatment plant. Due to limited budget, existing facilities are developed in only central area of the city. Some newly residential areas are developed with separate type sewerage system but, DaCRISS said, sewerage system development can’t catch up with rapid urbanization.

Table3.7 Outline of Sewerage in Da Nang City

Items		Present Status	Note
Wastewater	(1) Start of Operation	Year 2008	
	(2) Service Population	220,000 Persons	Rate of service pervasion 30 %
	(3) Treated Wastewater	453,000 m^3/day	
	(4) People with Sanitation	63,000 Persons	Pit Latrine, Septic Tank
Storm Water	(1) Start of Operation	Year 2008	
	(2) System	Combine (Interceptor Sewer) and Separate system both	
	(3) Return period	Branch: 2 year Trunk Main: 5~10 Year	Rainfall Intensity 120mm/hr

Source: JICA Study Team

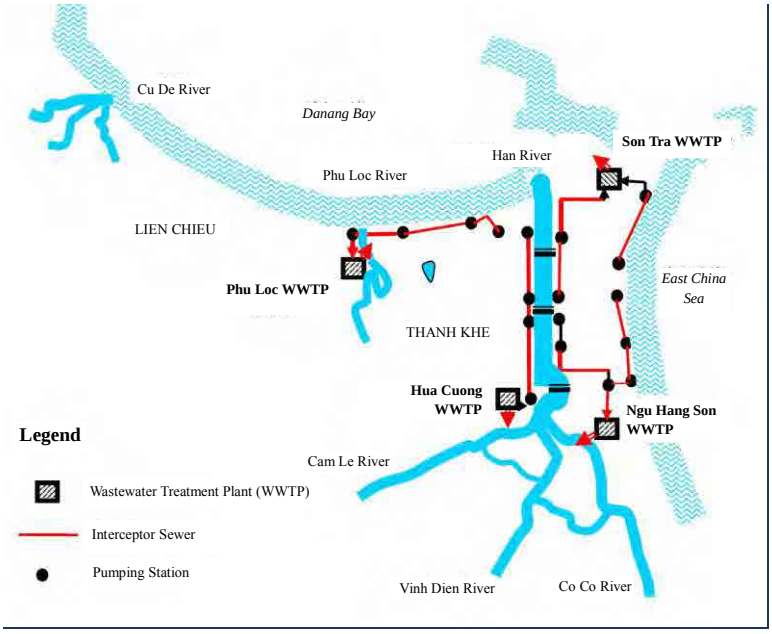
(ii) Sewer Network

3.41 Sewer network consists of gravity flow pipe of 15.7km and pressure pipe of 19.4km. Collected wastewater is send to wastewater treatment plant at 4 locations through 18 pumping stations. Since many households have septic tank without connection to sewer, coverage ratio of domestic wastewater is only 15%.

(iii) Wastewater Treatment Plant (WWTP)

3.42 Wastewater generated in Danang city is treated by 4 wastewater treatment plants shown in following table.

Figure3.15 Outline of Sewerage System in Da Nang City



Source: Study for the Project on Improvement of sanitary environment in Danang City [Ministry of Economy, Trade and Industry, Japan],2010

Table3.8 WWTP in Da Nang City

Name of WWTP	Capacity (m^3/day)	
	DaCRISS	Amended M/P
Hua Cuong WWTP	30,00	36,000
Ngu Hang Son WWTP	8,000	8,000
Phu Loc WWTP	8,000	36,000
Son Tra WWTP	12,000	10,000
Total	58,000	90,000

Source: DaCRISS

3.43 DaCRISS reported discharge from industrial park caused serious environmental pollution because only one out of 5 industrial parks has treatment facility. As of 2010, three out of 6 industrial parks have treatment facility as shown in following table.

Table3.9 Current Situation of Industrial Wastewater

Industrial Park			Treatment Facility	
Name	Location	Area	With/Without	Specification
Hoa Khanh IP	Lien Chieu District	423.5 ha	With	5,000 m^3/day, Screen, Oil separator, Sequencing Batch Reactor, Pressure filtration, Disinfection Discharge to Cu De River through Bao Cham Pond
Hoa Khanh IP (Expansion)	Lien Chieu District	326.52 ha	Without	
Lien Chieu IP	Lien Chieu District	307.7 ha	Without	
Da Nang IP	Son Tra District	50 ha	With	Start of Operation: Nov. 2011 Screen, Oil separator, Biological pressure filtration, Disinfection
Da Nang (fishery processing area)	Son Tra District	77.3 ha	With	5,000 m^3/day, Screen, Grit chamber, Primary sedimentation Tank, Reactor, Final Sedimentation tank, Disinfection Discharge to Danang Bay
Hoa Cam IP	Cam Le District	266 ha	Without	

Source: Study for the Project on Improvement of sanitary environment in Danang City [Ministry of Economy, Trade and Industry, Japan],2010

3.44 40% of hospitals in Danang city, mainly big scale hospitals, have wastewater treatment facility. However, DaCRISS reported O&M condition of these facilities was not disclosed and adequate treatment facility for polluted and hazardous wastewater is installed in only limited hospitals. As regards tourist industry, 5 hotels with five stars on East China Sea have treatment facility for wastewater.

(iv) Sewage Water Quality

3.45 Since 53% of septic tanks at households are saturation type septic tank which discharge only overflow to sewer, domestic wastewater quality of BOD is comparatively low, average 100 mg/l. Additionally, since mixture of domestic wastewater and storm water reduce sewage quality, inlet sewage quality of BOD at WWTP is very low, average 70 mg/l. Effluent quality from WWTP can't meet water quality standard, QCVN 14-2008/BTNMT, due to inadequate function of existing 4 WWTPs.

(v) Sludge collection and disposal

3.46 Even though low coverage ratio by sewerage system, sludge collection from septic tank by private sector are conducted in only limited area due to termination of government subsidy for septic tank sludge collection. Collected sludge from septic tank is treated at Khanh Son night soil treatment plant. Generated sludge at WWTP is thickened and dried. Dried sludge is send to dumping site with municipal solid waste.

(vi) Project management

3.47 Sewerage system in Danang city is constructed by DOT [Department of Transport] and operated by DDWTC [Danang Drainage and Wastewater Treatment Company] for sewer, pumping station and WWTP. Effluent quality is monitored by DONRE. Sewerage tariff for domestic wastewater is set as 15% of Water tariff and it is not enough for O&M cost of sewerage system. According to the Household Interview Survey in DaCRISS, citizens realize shortage of sewerage tariff for O&M and willingness to additional pay for sewerage tariff is confirmed.

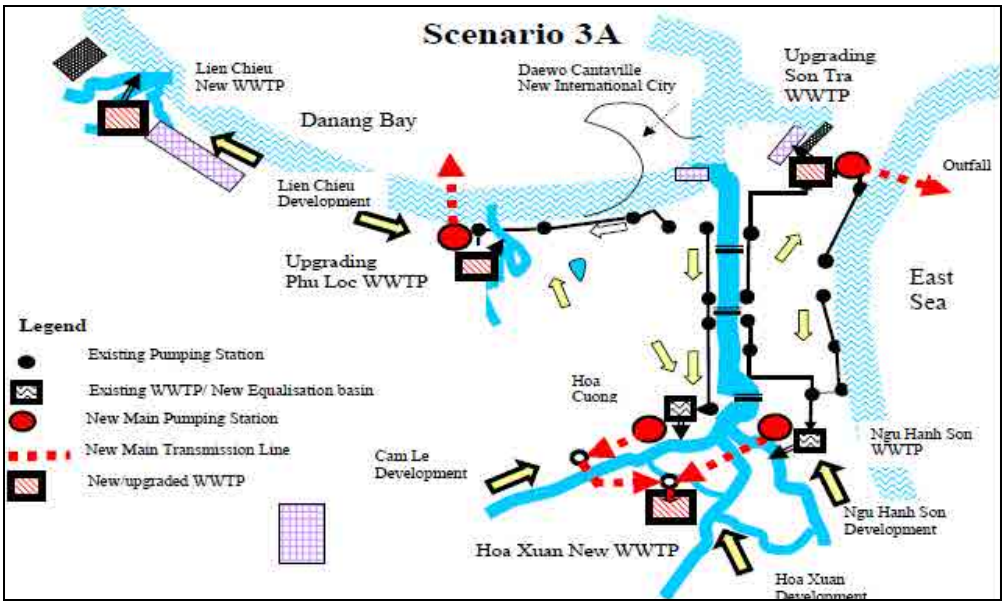
3.48 DaCRISS pointed out that DONRE can't manage water quality due to lack of their capability and should be assisted by international support.

(vii) Sewerage Project supported by World Bank

3.49 PIIP (Priority Infrastructure Investment Project) supported by WB prepared a Sewerage Master Plan for Danang city at April 2009. Desirable scenario in this PIIP have suggested dividing the city hydrological two parts, in which northern catchments area is treated 3 WWTP and southern catchments area is treated 1 WWTP, for sewerage system in Danang city.

3.50 PIIP includes 4 plans such as, 1) Connection of septic tanks to sewer, 2) Improvement of O&M for WWTP, 3) Program for enlightenment of citizens, 4) Control of buffer zone. By PIIP, Construction of new WWTP, install of separate type sewerage system and removal of deteriorated septic tanks have already conducted as a concrete plan.

Figure3.16 Sewerage system recommended in PIIP by World Bank



Source: World Bank PIIP

(4) Environmental Management and Solid Waste Management

(i) Legal System and Superordinate Plan

3.51 The legal system and superordinate plan of Vietnam and Da Nang City formulate the environmental management and solid waste management as described in the followings.

Table 3.10 Legal System and Superordinate Plan of Environmental Management and Solid Waste Management

	Name of Law/Plan	Main Contents
National Level Legal System	Law on Environmental Protection: No. 52/2005/QH11	The law prescribes the basic Articles for the policies on environmental protection, promotion of environmental protection, prohibited activities, etc. in addition to the Articles related with environmental quality standards, strategic environmental assessment, protection of natural resources, protection of coastal area and waterfront, pollution control by manufacturing and business activities, environmental protection in urban area and residential area, etc. Furthermore the laws prescribes the basic requirements of solid waste management, international cooperation in environmental protection activities and the law prescribes almost all the fields of environmental protection and conservation.

	Decree on Detailing and Guiding the Implementation of a Number of Articles of the Law on Environmental Protection: No. 80/2006/ND-CP	The Decree promulgates the details and guiding items for enforcement of the requirements under the Law on Environmental Protection. The Decree states 102 types of the projects require preparation of environmental impact analysis report and it includes the project to be carried out in the water source area, the ecological protection area, construction/improvement of port, wastewater treatment facilities, solid waste disposal site, waste incineration plant, etc.
	Decree on Solid Waste Management: No. 59/2007/NĐ-CP	The Decree promulgates the organization, household, rights of the individual, obligations, prohibition clauses, etc. for implementing the solid waste management activities. The Articles under the Decree state overall solid waste management activities including the contents for preparation of solid waste management plan, financial sources for development of the facilities, segregation of recyclables at sources, waste collection and transportation, waste storage, waste treatment, waste disposal, use of waste disposal site after closure, monitoring of environmental quality, service contract, promotion of investment, etc. The details of these Articles are further stated by the relevant decrees, standards, orders, etc. Main Items related with Solid Waste Management • Technical Requirements of Medical Waste (Decision No. 62/2001/QĐ-BKHCNMT) • Contents of Environmental Assessment Report Inter-Ministerial Circular No. 10/2000/TTBXD) • Handling Charge and Waste Fee（Circular No. 45/2006/TT-BTC、Circular No. 71/2003/TT-BTC、 Circular No. 63/2002/TT-BTC、 Governmental Decree No. 57/2002/NĐ-CP 等） • Design Criteria of Hazardous Waste Landfill （TCXDVN 320-2004） • Emission Gas Concentration Standard for Medical Waste Incinerator (TCVN 7241-2003） • Classification of Hazardous Waste (TCVN 6706-2000） • Required Conditions for Environmental Conservation of Sanitary Landfill (TCVN 6696-2000）
	National Standards of Atmosphere, Water and Others	• Combustion Gas Emission Standard for Industrial Activities: Dust and Inorganic Substances(QCVN 19/2009/BTNMT), Organic Substances (QCVN 20/2009/BTNMT) • Combustion Gas Emission Standard for Medical Waste Incinerator (QCVN 02/2008/BTNMT） • Combustion Gas Emission Standard of Industrial Hazardous Waste Incinerator (QCVN 30/2010/BTNMT） • Domestic Effluent Water Standard (QCVN 14/2008/BTNMT） • Industrial Effluent Water Standard (CVN 40/2011/BTNMT） • Effluent Standard of Landfill Leachate (QCVN 25/2009/BTNMT） • Environmental Quality Standard for Air (QCVN 05/2009/BTNMT), Toxic Substance Standards in Atmosphere (QCVN 06/2009/BTNMT) • Environmental Water Quality Standard for Surface Water (QCVN 08/2008/BTNMT） • Environmental Quality Standard for Sea Water in Coastal Area (QCVN 10/2008/BTNMT)
Da Nang City Ordinances	Environmental Management and Waste Management	• Environmental Management Regulations (Resolution of Da Nang City People's Committee, No.23/2010/QD-UBND, 10th August 2010) • Waste Management Regulations (Resolution of Da Nang City Peoples Committee No.3903/QD-UBND, 22nd October 1997) • Collection of Sanitation Service Charge (Resolution of Da Nang City People's Committee No.40/2011/QD-UBND, 31st December 2011)
National Strategies	Environmental Management Strategies : Prime Minister's Decision No. 1216/2012/QD-TTg	As an update version of the Presidential Decree No. 256/2003/QD-TTG, the national strategies formulate the national level environmental control strategies up to 2020 in addition to the outlooks up to 2030 against the increasing pollution, depletion of natural resources, loss of biodiversity, etc.

		Main Environmental Conservation Measures up to 2020 • Prevention and Control of Environmental Pollution Sources • Restoration of Polluted and Degenerated Environment for Acceleration of Water Supply and Sanitation Services, • Effective and Sustainable Use of Natural Resources, Conservation of Natural Protection Area, Biodiversity, • Structuring the Capacity to Respond Climate Change and Mitigation for Emission of Greenhouse Gas, • Structuring the Capacity to Respond Climate Change and Mitigation for Emission of Greenhouse Gas,
	Solid Waste Management Strategies : Prime Minister's Decision No. 1216/2012/QD-TTg	As an update version of the Presidential Decree , No. 152/1999/QD-TTG, the national strategies formulate the national level solid waste management strategies up to 2025 and the outlooks up to 2050. Overall Purpose of the Strategies up to 2025 • Upgrading the effectiveness of the integrated solid waste management for environmental quality improvement, public sanitation and ensure the sustainable development of the country, • Structuring the integrated solid waste management plan. As a result, segregation of recyclables at waste generation sources, collection, reuse, complete waste treatment by appropriate advanced technology, minimization of waste disposal amount for the economizing the land resources, prevention of environmental pollution, appropriate management and handling of hazardous waste, etc. shall be implemented., • Raising awareness of the communities, forming of environmental-friendly life style, requirements of infrastructures, investment and human resources are used for establishment of the integrated solid waste management, Target Level of Main Activities • Collect 85% of domestic waste and recycling of 60% including composting and energy recovery by 2015. In 2025, the said target ratio shall be realized up to 100% and 90% respectively, • Collect 50% of construction waste and realize recycle ratio of 30% up to 2015. In 2025, the said target ratio shall be realized up to 90 % and 60% respectively, • Implementation of waste segregation at households with the target ratio at 50% in 2015 and 80% in 2020, • Appropriate waste disposal of hazardous waste discharged from the industrial estates with the target ratio at 60% in 2015 and 100% in 2025.

Source: JICA Study Team

(ii) The Plan for "Developing Da Nang-The Environmental City"

3.52 "Developing Da Nang-The Environmental City" (herein after referred to as DDEC Plan) was formulated and approved by the Da Nang People's Socialist Republic of Vietnam Committee on 21 August 2008 (No. 41/2008/QD-UBND) based on the requirements of the relevant laws, ministerial decisions and the resolution. In recognition of Da Nang becoming "The Environmental City" by the year 2020, the specific goals, plans and budget are prepared by the phased development for the period of "2008-2010", "2011-2015" and "2016-2020". Some of the specific goals in each period are summarized as follows.

Table 3.11 Phased Goals of DDEC Plan

Target Year	Phased Goals
2008-2010	• Treatment of leachate from Khanh Son landfill, • Build wastewater treatment system in industrial zones at Hoa Khanh, etc. • Completely resolve air pollution in factories and enterprises, especially for metal industry and cement, seafood production, etc. • Collect all domestic and hazardous waste to the ratio of 95% and 100% respectively and increase solid waste recycling up to 30%,
2011-2015	• Treat 90% of wastewater of industrial parks and export processing zones, • Collect and treat 90% of residential grey water (sewage), • Control of the sources of toxic waste and treat toxic waste, • Form and develop recovery technology for reuse and recycling of recyclable waste up to 50%, • Ensure 90% of the urban population and 70% of the rural population to access to clean water, • Control air pollution caused by transportation industry and other urban activities to ensure air pollution index (API) 100, • Develop green areas in the inner city to 3-4 m^2 per capita, and • Protect forests and conserve the bio-diversity within the city.
2016-2020	• Continue the activities to ensure the goals of the period 2008-2015 to ensure 100% of industrial and domestic wastewater, • treatment, recycling of 70 % solid waste and wastewater reclamation of 25%, and • Perfect the basic data for evaluating and declaring Da Nang "The Environmental City".

Data Source: The Plan for "Developing Da Nang-The Environmental City"

3.53 . Among the total number of 41 planning items of DDEC Plan, the status of progress of the works carried out mainly under the responsibility of DONRE are summarized as follows.

Table 3.12 Progress of Work of DDEC Plan in Charge of DONRE

Planning Item	Progress of Work
1) Monitoring Network	Under structuring. Three auto air quality monitoring stations are in operation in the city area. The auto water quality stations for the rivers, ponds, harbors have not yet installed. However, about 40 sampling stations have established for water quality analysis in every other month. Present number of staff engaged in monitoring activities is 14 people.
6) Development of CDM Project	Development of CDM projects is called by "Clean to Green" and the plan is expected to be carried out by the Ministry of Environment of Japan. The first meeting was held and waiting for the next meeting.
14) Conservation of River Basin and Coastal Area	Under preparation of the planning policies
16) Appropriate Use of Water Sources	Zoning work is carried out now.
19) Measures for Leakage of Leachate from Old Khanh Son Waste Disposal Site	Completed
21) Automation of Environmental Quality Monitoring	The plan is expected to implement by BOT with the investment of Da Nang at 20% and the private sector at 80%.
24) Hazardous Waste and Medical Waste Incinerator	The plants were installed in 2009 (capacity :100 kg/hour) and the following year in 2010 (capacity 200 kg/hour). The total incineration capacity of the two plants is 300 kg/hour and the plants treat hazardous waste and medical waste 800 to 1,000 kg/day approximately. The incinerators are fabricated by the Vietnam technology of STEPRO Co. Ltd.
25) Segregation at Sources, Reuse and Recycling	The plan has not yet implemented. GIZ has expressed its intention of supporting the processing of organic waste.
26) Safe Closure of Old Khanh Son Waste Disposal Site	Earth covering and peripheral drainage have installed. Leachate from the landfill site is transferred to the new Khanh Son leachate treatment facilities by water tanker.
27) PPP Project for Waste Collection, Transportation and Treatment	Waiting for the investor(s).
28) Strategic Environmental	Completed

Assessment (SEA) for Social and Economic Development Plan	
31) Review of the DDEC Plan	DDEC Plan requires the structuring of database on land use, biological resources, environmental status, public sanitation, etc.
34) PPP Project for Environmental Conservation	Under consideration
35) Management and Control of Industrial Pollution	Under consideration
41) Environmental Conservation Fund	Under preparation of the plan

Source: JICA Study Team based on interview from DONRE

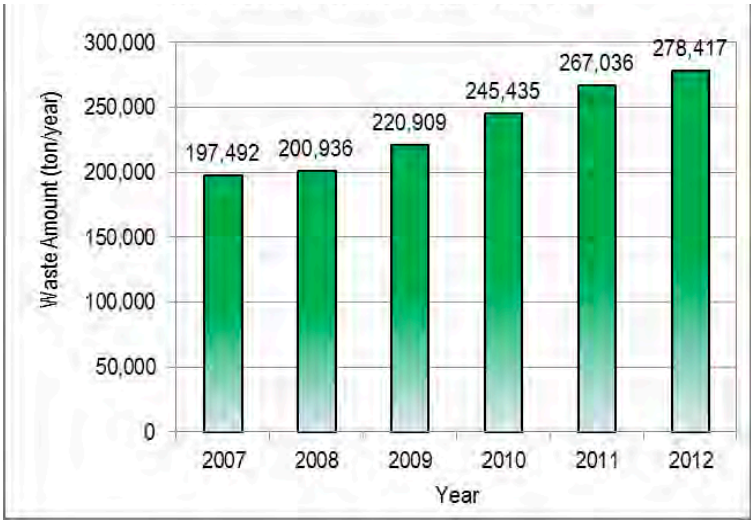
3.54 Situation for environmental management other than the items described above are as follows. Firstly, dioxin is a matter of central government (Ministry of Defense) and Da Nang City has no own measures. The project for detoxification of contaminated soil is implemented at the airport of Da Nang City, but no information is provided about this project. The plan for the climate change measures has been prepared and is being carried out for the part of the Action Plan. The plan for biodiversity measures has not been prepared. However, the biological survey was carried out with the cooperation of the University for the mountains, in the beach.

(iii) Status of Solid Waste Management Activities in Da Nang City

(a) Waste Collection and Transportation

3.55 Annual waste collection amount in Da Nang City increase by 40 % from 197 thousand ton/year (540 ton/day) in 2007 to 278 thousand ton/year (760 ton/day) in 2012. Da Nang collects general wastes from households and industries, a part of hazardous industrial waste, septic tank sludge, etc. However, in 2012, general waste occupies the largest portion of waste collection as 91% or 692 ton/day followed by septic tank sludge collect 7% or 54 ton/day. Assuming the population of 928 thousand and the waste collection ratio at 87% in 2012, the per capita waste discharge rate is estimated at 945 g/c/d.

Figure 3.17 Annual Waste Collection Amount in Da Nang(ton)



Source: JICA Study Team based on the data from URENCO

Table 3.13 Breakdown of Waste Collection Amount in Da Nang City (2012)

Item	Collected Solid Waste Amount		Ratio
	(ton/year)	(ton/day)	(%)
Urban Domestic Waste	252,504	692	90.7%
Non-hazardous Industrial Waste	3,723	10	1.3%
Hazardous Industrial Waste	404	1	0.1%
Non-hazardous Medical Waste	1,889	5	0.7%
Hazardous Medical Waste	209	1	0.1%
Sludge from Septic-Tanks	19,688	54	7.1%
Total	278,417	763	100%

Source：JICA Study Team based on the data from URENCO

3.56 In Da Nang City, municipal waste is collected by waste compactors going round the town and load waste in waste containers placed along the streets. The waste containers sizes range from 140 liter to 660 liter, rather small size, are placed in town. The estimated waste storage capacity of the total number of 4,700 waste containers is estimated at 260 ton. Other than the smaller waste containers mentioned above, there are waste collection stations placed with large size waste containers.

Table 3.14 Estimated Waste Container Storage Capacity

Container Size (Lit.)	No. of Containers	Total volume (m^3)	Assumed Bulk Density (ton/m^3)	Estimated Storage Capacity (ton)
140	190	27	0.15	4
240	4,193	1,006	0.15	151
280	540	151	0.15	23
660	809	534	0.15	80
Total	5,732	1,718		258

Data Source：JICA Study Team based on the data from URENCO

3.57 There were 16 large waste container collection stations before but only six stations are in use now since some of the collection stations were abolished due to complains by the neighboring residents. Hoa An large waste container station is placed with 18 m^3 closed type container. Waste collectors bring waste containers to the station collected from the streets in the vicinity and unload waste to the hopper for compressing and pushing into the large waste container. Then, the large waste container is rolled on to the hook lift type truck and transported to the landfill site. Waste transportation of the Hoa An waste collection station makes 5 trips per day in average. The total storage capacity of the waste containers is smaller than the waste collection amount of 760 t/day in 2012.

3.58 URENCO possess 43 units of compactors for waste collection services. The oldest compactor has been used since 1995. The total loading capacity of the compactors computed from the rated loading capacity is estimated at 274 ton per one trip. There are 27 vehicles exceeds the operation more than 10 years and the total number of vehicles include the vehicles in repair and breakdown. The time has come for procurement of new collection vehicles accordingly. Other than the compactors, URENCO owns hook lift trucks, road sweepers, vacuum cars for septic tank sludge, hazardous waste collection vehicles, etc.

3.59 URENCO has started the fixed time waste collection pilot project including one residential area and 22 streets since one and half years ago. Waste container collection, the same system with other areas, is carried out presently but the collection by waste bags

will be tested hereafter. The final evaluation of the pilot project has not yet made but it is expected to reduce the number of waste collection staff by 50%.

(b) 3R and Intermediate Treatment

3.60 The 3R activities under the initiatives of Da Nang City has not yet implemented up to now. However, the numbers of waste pickers collects recyclables from the waste containers in town and approximately one hundred of waste pickers recover recyclables at the final disposal site. The recovery amount of recyclables are not known since the survey has not yet carried out. URENCO has a plan to carry out source separation and recovery of recyclables at the pilot study area and applied a budget in 2010 but the budget has not yet approved up to now. The pilot study will be carried out immediately after approval of the budget to conduct the pilot study for promoting the 3R activities including waste reduction, sorting at sources, reuse and recycling.

3.61 A recycling plant is constructed at the adjacent area of Khanh Son disposal site by the investment of private company. Although the plant is partly completed but still in construction, the information says that the contract for construction, operation and maintenance between Da Nang City and the private company has not yet concluded. The plant consists of separation and recovery equipment of recyclables and plastic pyrolysis equipment as shown in the followings.

- Separation and Recovery System : Capacity 600 t/day (200 t/day x 3 series)
- Plastic Pyrolysis Equipment: Capacity 69 t/day (23 t/day x 3 series)
- Heat: Heat source for pyrolysis some of the recovered oil and LPG
- Efficiency of Liquidation : 500 liter of oil per 1 ton plastic input
- Existing Waste Plastic Liquidation Plant: Four plants in Vietnam including this plant

3.62 One series of the plant among three series of the plant has almost completed and test operation was conducted. However the incoming power line and receiving panel have not yet installed although applied for the power supply.

Figure 3.18 Waste Plastic Separation, Pyrolysis and Liquidation Plant in Construction

Source: JICA Study Team

(c) Final Disposal

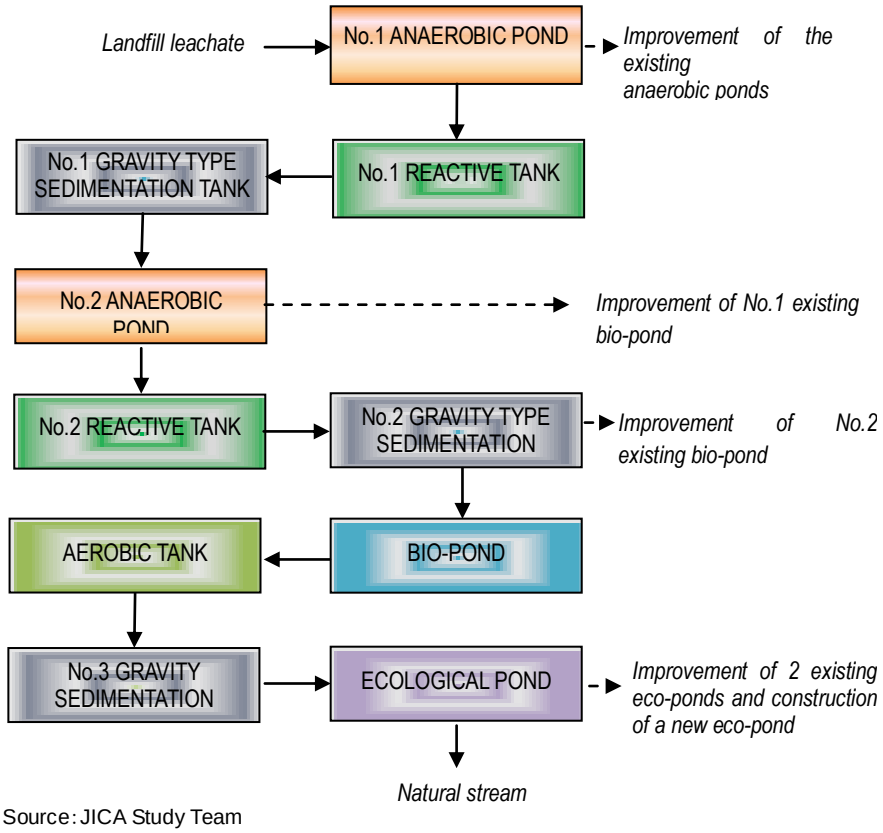
3.63 New and Old final disposal facilities are located in Khanh Son Area. The old final disposal facilities is located in the Southwest about one km away of the new final disposal facilities and closed in the end of 2006. The landfill area is 10 ha and landfilled approximately 1.2 million ton in 15 years until the closure of the landfill site in 2006. Operation started at the present new landfill in January 2007 with the landfill site area of 15 ha and the planning landfill amount of 4 million ton. Approximately 1.4 million ton was landfilled as of today. The landfill period is planned for 13 – 15 years.

3.64 The waste disposal facilities is constructed for the type of sanitary landfill and water-shielding system is structured the double lining system by the layers, from the surface, protection gravel layer, plastic sheet, geo-textile, and 30 cm clay layer. The construction cost of present disposal facilities and the leachate treatment facilities (initial facilities) is 2.9 million US$ which is financed by ODA of Australian Government. Design of disposal facilities is carried out by Australian consultant and the leachate treatment is made by the Vietnam technology. Leachate flow in dry/rainy seasons fluctuate in the range of 200 ~ 700m^3/day in average. The leachate treatment facilities started operation simultaneously with the operation of the new disposal facilities in 2007, however, the treatment efficiency of three bio-tanks has become low and could not meet with the effluent standard since 2009. As a results of improvement of the facilities and operation & maintenance by the private company through installation of anaerobic pond and chemical sedimentation (coagulant: iron chloride), the treated water quality improved drastically.

Figure 3.19 Khanh Son Waste Disposal Facilities and Leachate Treatment Facilities

Source: JICA Study Team

Figure 3.20 Leachate Treatment Process of New Khanh Son Disposal Facilities

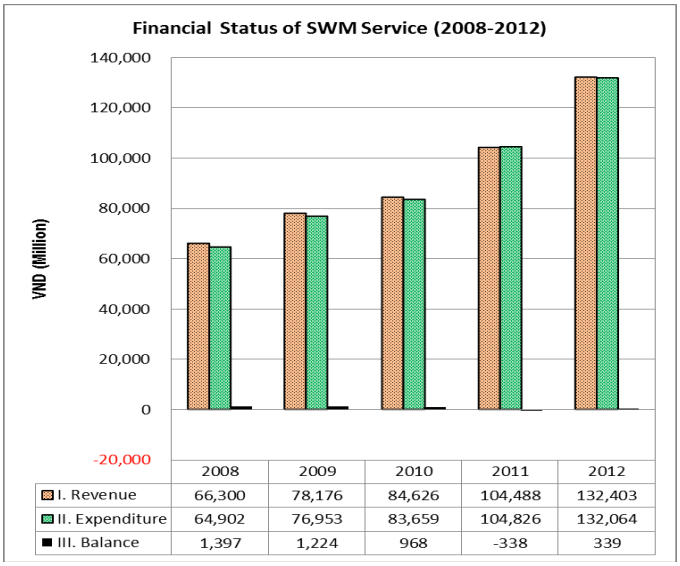


Source: JICA Study Team

(d) Hazardous Waste Treatment

3.65 Medical waste from hospitals, clinics and hazardous waste from factories are collected mostly by Da Nang City and partly collected by the service of private sector. Presently, medical waste and hazardous waste are treated by incineration by the facilities installed in the corner of the disposal site. Two incinerators are installed with the capacity of 100 kg/hour (operation started in 2009) and of 200 kg/hour (operation started in 2010). Present incineration treatment amount is in the range of 800 ~ 1,000kg per day. The incineration residues after cement solidification are landfilled at the separated landfill cell in the Khanh Son disposal site. The respective incinerator is designed with two combustion chambers. The first combustion chamber is heated in the range of 600～800℃ and the second combustion chamber is heated more

Figure 3.21 Revenue and Expenditure of Cleansing Services by URENCO（2008-2012）



Source: JICA Study Team based on the data from URENCO

than 1,000℃ for decomposition of hazardous matters. Combustion gasses is discharged in to the atmosphere after removal of remaining hazardous matters. It was the view of the operating personnel that there is no functional problem of the incinerator at this stage, but it seems that there is inconvenience to the input of waste to the furnace. Also a part of the stack is damaged and it may influence to the state of combustion.

Figure 3.22 Hazardous Waste Incinerators, Cement Solidification and Landfill

Source: JICA Study Team

(iv) Financial Status

3.66 The total revenue increased from 66.3 billion VND (332 million Yen) in 2008 to 132.4 billion VND (662 million Yen) in 2012 and the expenditures also increase from 64.9 billion VND (325 million Yen) in 2008 to 132.1 billion VND (661 million Yen) in 2012. The annual balance has a profit in the last 5 years except for the year 2011. The profit before tax is 339 million VND (1.7 million Yen) in 2012. Comparing with the increase of waste collection amount by 40% in the last five years, the expenditure increase by 100% and the unit cost of waste in 2012 reached at 474 thousand VND (2,370 Yen) per ton.

(v) Sanitation Charge (Waste Fee)

3.67 The present sanitation charge (waste fee) collected is based on the resolution of No. 40/2011/QD-UBND Da Nang City. The waste tariff is categorized with 21 groups based on the waste amount and the type of waste. For reference, the household waste fee is set at 10,000 ~ 20,000 VND (50 Yen ~ 100 Yen) per month、the households running business is set at 30,000 ~ 60,000 VND（150Yen ~ 300 Yen）. Also, the medical waste at the hospitals perform surgery are charged at 300,000VND (1,500Yen) per month. In addition, hazardous waste including incineration treatment is charged at 6,000 VND（30 Yen）per kg.

3.68 Regarding the revenue amount and the sources from 2008 to 2012, the revenue from waste fee account for 35 % approximately in the last five years and the waste fee

revenue reached at 47.3 billion VND（236 million Yen）in 2012. Da Nang City subsidizes annually the amount exceeding the ration a little over 50% to the total revenue. The total budget of cleansing service is amounting at 67.3 billion VND (336 million Yen) in 2012.

Table 3.15 Amount of Annual Revenue and Sources of URENCO (2008-2012)

Year	2008	2009	2010	2011	2012
Annual Revenue (M. VND)					
1. Revenue from Sanitation Fee	23,561	25,675	29,247	36,256	47,290
2. Revenue from the City Budget	34,880	41,801	43,033	53,416	67,256
3. Revenue from Other Activities	7,859	10,700	12,347	14,816	17,857
Total Revenue	66,300	78,176	84,626	104,488	132,403
Ratio of Revenue Sources (%)					
1. Revenue from Sanitation Fee	36%	33%	35%	35%	36%
2. Revenue from the City Budget	53%	53%	51%	51%	51%
3. Revenue from Other Activities	12%	14%	15%	14%	13%
Total Revenue	100%	100%	100%	100%	100%

Source: JICA Study Team based on the data from URENCO

8) Urban Planning and Urban Development

(1) Socio-Economic Development Plan

3.69 The Socio-Economic Development Plan (SEDP) is formulated in every five years by the Da Nang People's Committee and relevant departments such as Department of Planning and Investment (DPI) of Da Nang City, which was revised in 2011 is up to date now. Economic conditions of Da Nang City, opportunities and challenges, and goals and objectives for the period of 5 years from 2011 are described. Contribution of regional major tourism resources and facilities to economic growth, and importance of opening of economy and market are indicated.

(2) City Master Plan (Construction Plan)

3.70 The Master plan of Da Nang City, which is called the Construction Plan is composed of a general plan of urban areas and regional plans. The Department of Construction was in charge of drafting, through consultation with relevant organizations. After the People's Committee approval, the "General Construction Plan of 2030 with the vision of 2050", received the Prime Minister approval.

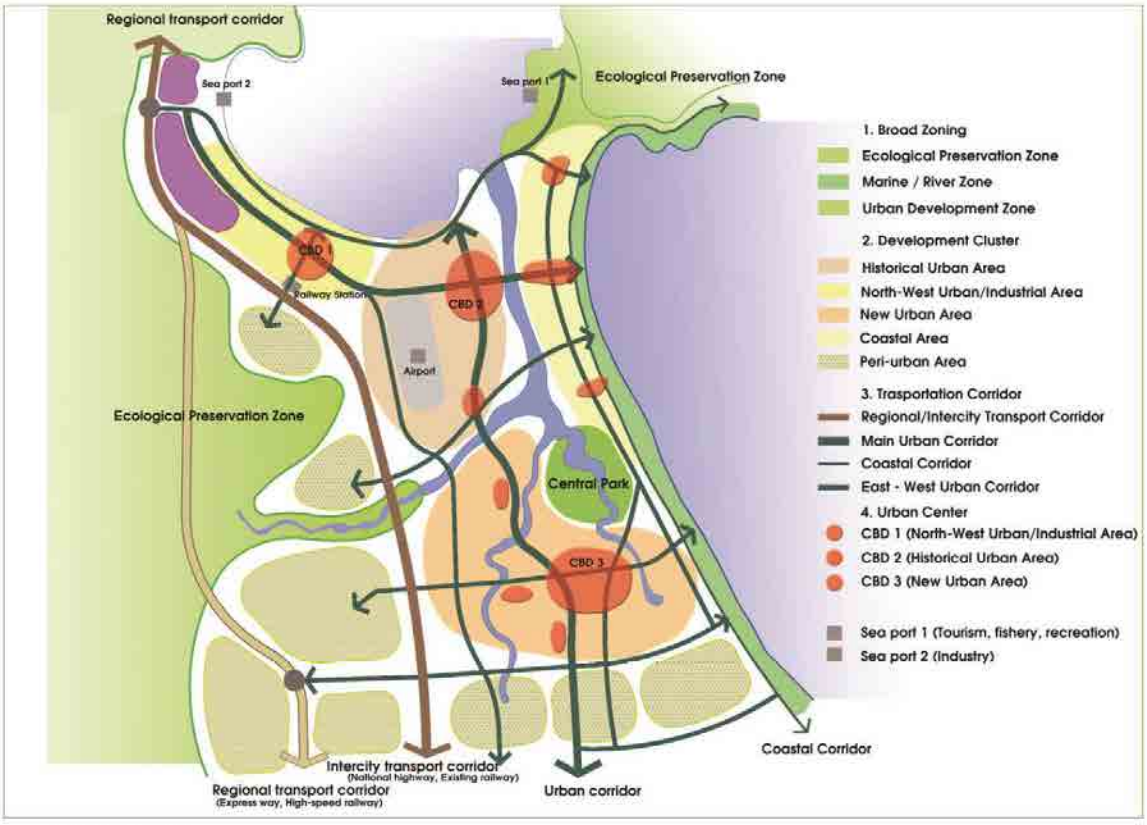
3.71 The basis of the approved master plan is City Development Master Plan Study (DaCRISS) which was conducted in 2010 by JICA. 's Become this base, Da Nang City, urban development master plan, which was conducted in 2010 is (DaCRISS). This study was a comprehensive urban plan which the mayor of Da Nang City chaired the Steering Committee. In this study, it was discussed that: a sustainable development of Da Nang City was limited only with small population and limited hinterlands, it was essential to develop as a leading force in the central economic zone. The strategies to take advantage of the strengths while to cover weakness were discussed among stakeholders, which are summarized as follows:

- Da Nang City applies for different growth strategies as Hanoi City and HCMC (with a large hinterland population and development of FDI-led, mainly in the manufacturing industry). The strategies are based on industrial location and development taking into considerations of strengths of the central region, such as 3 world heritages, natural

environment, good living environment (tourism, IT, education, human resource development, medical services, etc.).

- Da Nang City connects to the world as an international gateway by air to Asian countries in particular, not through to Hanoi and HCMC. Connection with the neighboring countries through East-West Corridor of GMS is strengthened. Connection between the major cities in Vietnam, including Hanoi and HCMC by attracting tourism, recreation and investment from Ho Chi Minh City and Hanoi.
- Da Nang City formulates city development strategies to maximize welfare of citizens with a synergistic effect by incorporating these external factors.
- Da Nang City strengthens cooperation with Hue Province and Quang Nam Province for regional coordination.
- Da Nang City positions and internalize the effects of national projects properly such as North-South highway, North-South high-speed railway, North-South railway improvement, port development, airport development, etc.
- Da Nang City aims of 2.5 - 3 million population as a competitive urban core with accumulated high-quality services.
- Da Nang City is limited land areas, framed by the sea of east, mountains of west, mountains and sea of north. Compact city development is enabled with mass rapid transit corridor of south-north, and CBD development along this corridor to guide distribution of urban functions, as well as population increase and urbanization properly.

Figure 3.23 Urban Structure of Da Nang City



Source: DaCRISS

3.72 Basic concepts as results of discussion of DaCRISS were reflected to the approved Master Plan. For example, Central Business Districts are indicated as follows:

- Existing city centers (Hai Chau District, Thanh Khe District, a part of Son Tra District) where Provincial PC, Han River and airport are located
- Ngu Hang Son District where district PCs are located. Small-scale businesses are clustered. It is a cultural center with Marble Mountains.
- Lien Chieu District as north-west new CBD, with high development potential along National Highway 1A, industrial zones and Lien Chieu Port. The railway station will be relocated to this area. It will take a long time to develop new urban areas.
- Cam Le District in south. Population has not been increase while basic infrastructure has already developed.

3.73 The construction plan of the 2030, it is recognized the need for rail-based transportation, from the city center (Trung Vuong Theatre), via the Hue intersection, to go to south from west of Hue intersection and industrial park of Lien Chieu.

Figure 3.24 General Construction Plan of Da Nang City in 2030 with vision of 2050

Source: General Construction Plan of Da Nang City in 2030 with vision of 2050

(3) Threats of current development trend

3.74 Coverage of the master plan is limited to only Da Nang City, but the actual development trend is going to Quang Nam Province to the south side. While the resort development along the coast has progressed rapidly in particular, there is also a lack of resources of the city infrastructure development of the new city in the south.

3.75 Construction of high-rise buildings is progressing along with Han River, so the

landscape has been deteriorated caused by mushrooming of commercial signage along the river. Because Da Nang airport is located in the city center, building height is controlled while landscape regulation has not been made.

3.76 As a future goal of Da Nang City, has set the industrial development that is based on IT, development of high-tech Park is underway. In addition, Japanese companies have operated in existing industrial parks, which contribute to the promotion of employment in Da Nang City and neighboring provinces. Many of the Japanese companies, is that with the feel and challenge and lack of human resources manager class, the poor performance of engineers on the other hand.

(4) Urban Transport Plan

3.77 Department of Transport of Da Nang drafted “Urban Transport Master Plan in 2020 with the vision of 2030” in 2012, supported by the World Bank. As a comprehensive transport management plan, it is proposed that parking development, new road network development, bridge development, signal network development, etc.

3.78 After completion of the Priority Infrastructure Investment Project (PIIP) from June 2008, Sustainable Development Project has been implemented from June 2013 for 5years. PIIP includes following 4 components:

- Bass Rapid Transit (BRT)
- Da Nang – Quang Ngai Ring Road (7km of north part, 7.8km of south part)
- 3 sewerage treatment plant and pipelines
- Capacity development for above

3.79 According to the World Bank, it is planned to complete 3 BRT network and bus network at the beginning of 2017. In case of bus, the study on Socialization of Bus System was conducted to promote public transport by restructuring of bus network.

9) Urban Administration

3.80 The highest organization of local administration is the People’s Committee. In case of Da Nang City, the PC controls 17 departments. The Chairman of People’s Committee is the highest authority of local administration. At the same time, each department is line departments under the Ministries.

3.81 On the contrary, Communist Party has independently existed which has an actual control power. In case of Da Nan City, the Secretary of the Party Committee leads urban development of the city which makes final decisions.

Table 3.16 Departments of Da Nang City

Departments	
Department of Investment and Planning (DPI)	Department of Internal Affairs (DOIA)
Department of Finance (DOF)	Department of Foreign Affairs (DOFA)
Department of Industry and Trading (DOIT)	Department of Education and Training (DOET)
Department of Construction (DOC)	Department of Health (DOH)
Department of Transportation (DOT)	Department of Labor, War Invalids and Social Affairs (DOLISA)
Department of Natural Resources and Environment (DONRE)	Department of Justice (DOJ)
Department of Science and Technology (DOST)	Department of Information and Communications (DOIC)
Department of Agriculture and Rural Development (DARD)	Department of Inspection (DOI)
Department of Culture, Sport and Tourism (DOCST)	

Source: JICA Study Team

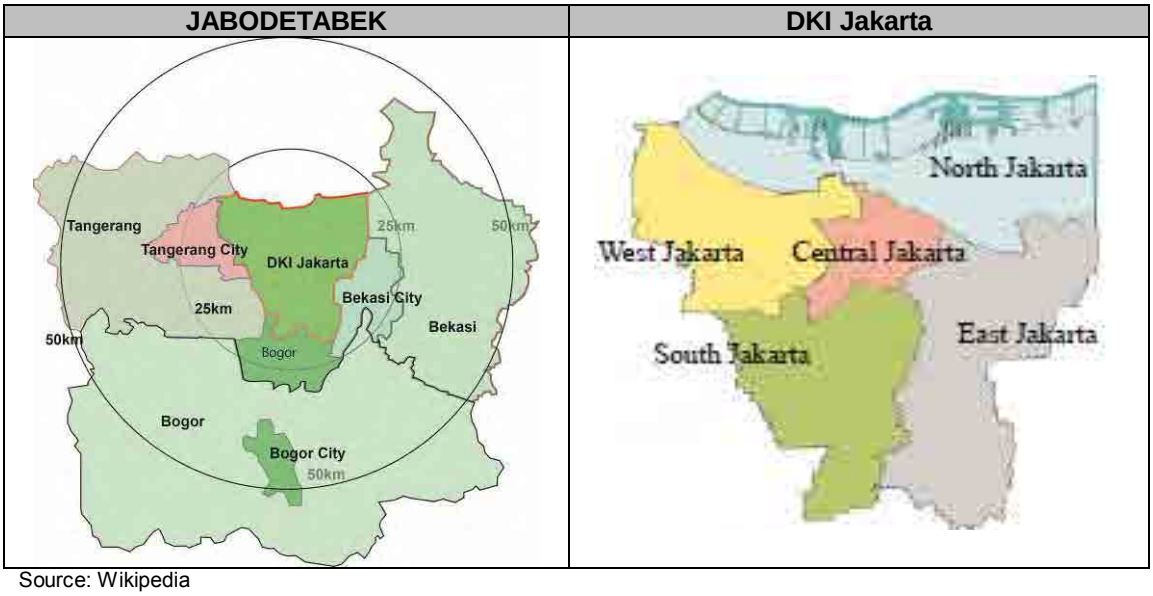
(2) Present Condition and Issues of DKI Jakarta

1) Location

3.82 DKI Jakarta is the administrative province of a one from Kepurauan - Seribu Prefecture of islands (North Jakarta, West Jakarta, Central Jakarta, East Jakarta, and South Jakarta), the capital of Indonesia with 950 million people and it is the largest city. Far beyond the administrative boundaries of the Jakarta Special Province, metropolitan area actually extends over the surrounding municipalities.

3.83 JABODETABEK is a term that refers to the urban area around Jakarta . Three districts of Tangerang district four cities of Tangerang and Jakarta, Bekasi in West Java, Bogor, Depok, of Banten, Bekasi district in West Java, Bogor district, of Banten Jabodetabek metropolitan area, from (regency) is configured. Population of 2010 in the current 28 million people, is a metropolitan area of Indonesia, it is a metropolitan area that enters the finger 10 in the world . JABODETABEK is the acronym of the name of each city (Jakarta, Bogor, Depok, Tangerang, Bekasi).

Figure 3.25 JABODETABEK and DKI Jakarta



Source: Wikipedia

2) History

3.84 Jakarta has evolved as an important port city and for trade with China, incorporated in the trading network in Asia under the Ming Dynasty of China, established in the 14th century. Flourished as a base of the East India Company under the control of the Netherlands from the end of the 16th century, but Japan was occupied almost the entire area of the East Indies in World War II. Ever since, the population was large influx from the islands and provinces also, to focus on the Jakarta political function, the economic function, it has grown into one of the city's largest in Asia really independent as the Republic of Indonesia in 1949.

3.85 The central district, which is formed in Batavia era of northern close to the coast, has been developed including downtown area called "Kota" and a new district including ministries, schools and residential areas which were developed after independence. There is an outer harbor Tanjung Priok in the north.

3.86 Japanese economic cooperation started from 1954 to receive trainees. The origin of

Japanese ODA is toward Indonesia. In December 2010, Memorandum of Understanding for Metropolitan Priority Area (MPA) was signed to cooperate with investment environment development and infrastructure development.

Table 3.17 Major Indicators of DKI Jakarta

Indicator			Year 2010
Area (km^2)			740.28
Population	000		9,588
	Growth rate (%)		1.4 ('00-'10)
	GRDP per capita (US$/per)		3,500
Social	Poverty rate (%)		3.5
Infrastructure	No. of vehicles (000)[1)]		9,648
	Coverage (%)	Water	46
		Solid waste collection	82

Source: JICA Study Team
1) JABODETABEK excluding Bogor

3) Socio-Economic Condition

(1) Population

3.87 Jakarta became the capital of the Republic of Indonesia in 1949, and expanded to the surrounding areas with 173 million populations in 1950. Urban functions were accumulated to Jakarta including not only political function but also economic function which was the same scale of Surabaya. Jakarta became one of the largest cities in Asian countries, by inviting population from rural areas and islands.

3.88 With economic growth, the integration of urban functions and increase of the population go, like capital of other developing countries, Jakarta has serious urban problems such as lack of urban infrastructure such as roads, sewer, and housing. Population of 2010 has more than 9.6 million people, and population of metropolitan area including the suburbs is more than 28 million. The population density is generally high, which is 14,476 people / km^2.

(2) Socio-Economic Condition

3.89 Development of urban infrastructure was proceeded from 1966 to 1977, and the expansion of urban areas went on to be the east-west direction from the north-south direction. In addition, around the same time of new town development, improvement plans of Kampong, a high-dense residential area in the entire city were also promoted.

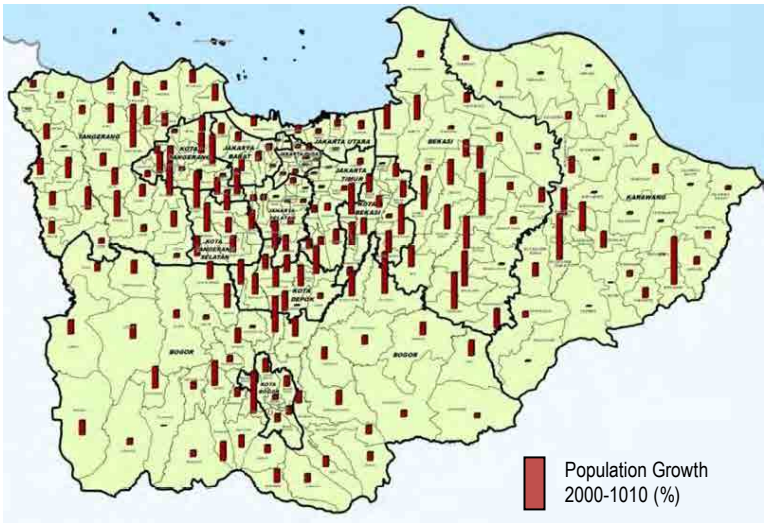
3.90 The actual GDP growth rate in recent years has achieved 6.5% in 2011, which was the highest after the Asian currency crisis of 1997-1998. Now Indonesia became the G20 member country.

Table 3.18 Area, Population and Population Density of JABODTABEK

Region	Area (km2)	Population (000)			Population Density (per/km^2)
		2000	2010	Growth Rate (2000-10)	
JABODETABEK MPA	6,401	21,232	27,951	2.79%	4,367
DKI Jakarta	664	8,389	9,588	1.34%	14,440
MPA East (Kota Bekasi Kab. Bekasi)	1,480	3,332	4,966	4.07%	3,355
MPA South (Kota Depok Kota Bogor Kab. Bogor)	2,982	5,403	7,456	3.27%	2,500
MPA West (Kota Tangerang Kota Tangerang Selatan Kab. Tangerang)	1,275	4,107	4,901	3.76%	3,844

Source: Presentation of MPA Committee

Figure 3.26 Population Growth of MPA



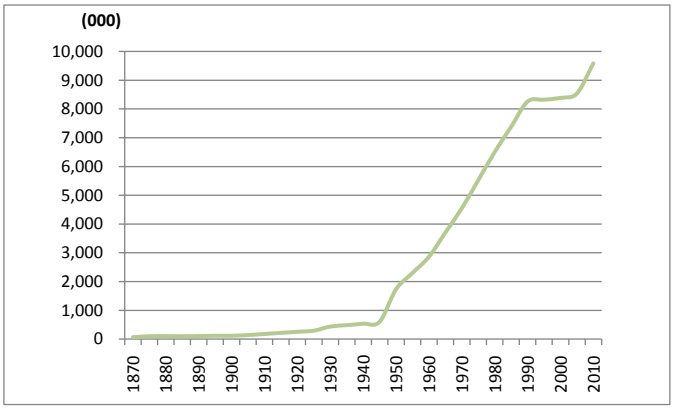
Source: Presentation of MPA Committee

Table 3.19 Population of JABODETABEK

Admin	Area (Km2)	2000	2005	2010	Population Growth (2010/2000)	Population Density (Km²)(2010)
Jakarta	664	8,389,443	8,699,600	9,607,787	15%	14,470
Bogor City	22	743,478	844,778	866,034	16%	39,365
Depok City	200	1,146,055	1,373,860	1,751,696	53%	8,758
Tangerang City	184	1,311,746	1,488,666	1,772,700	35%	9,770
Bekasi City	210	1,639,286	1,994,850	2,378,211	45%	11,325
Bogor (excluding city)	3,441	3,508,826	4,100,934	4,770,744	36%	1,386
Tangerang (excluding city)	1,110	2,775,254	3,194,282	3,311,538	19%	2,983
Bekasi (excluding city)	1,484	1,642,714	1,953,380	2,378,211	45%	1,603
Total	**7,315**	**21,156,802**	**23,650,350**	**26,836,921**	**27%**	**3,672**

Source: JICA Study Team

Figure 3.27 Population Change of JABODETABEK



Source: Census of Indonesia

Table 3.20 Area and Population of DKI Jakarta in 2010

	Area (km²)	Population	Population Density (per/km²)
South Jakarta	141.27	2,057,080	14,561
East Jakarta	188.03	2,687,027	14,290
Central Jakarta	48.13	898,883	18,676
West Jakarta	129.54	2,278,825	17,591
North Jakarta	146.66	1,645,312	11,218
Kepulauan Seribu	8.7	21,071	2,422
DKI Jakarta	662.33	9,588,198	14,476

Source: Census of Indonesia

4) Spatial Structure

3.91 DKI Jakarta, including 5 admin districts, is an alluvial plain (656km^2) of 25km east to west, 25km north-south, and urbanization areas are spread almost entirely, with 9.5 million inhabitants.

3.92 Medium and large factories in hinterland of Tanjung Priok harbor and old town of the northern region are concentrated. Urban area has expanded to the south direction from the old town, the center of political and economic facilities are located in the central region. In addition, the southern region, in areas in accordance with the expansion of the city, is developed as a satellite city with high-end residential areas and large-scale shopping centers. Industrial facilities are clustered in the east and small-scale entities are in the west. The main urban corridor is south-north connecting the old town and satellite cities, and the industrial corridor is leading to east-west.

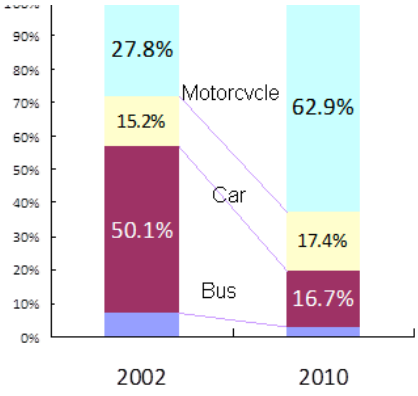
5) Urban Transport

3.93 Urban transport of DKI Jakarta highly depends on road transport (98%), and number of registered vehicle has been rapidly increased (2.4times from 3.26mil. in 2000 to 7.97mil. in 2006). Serious traffic congestion causes large economic loss.

3.94 JICA, carried out many transport infrastructure construction loan projects (toll roads, flyovers, etc.) the yen loan as war compensation from 1960's, and recently, there are many technical assistance projects such as transport policy and planning projects.

3.95 JICA Study on Integrated Transportation Master Plan for JABODETABEK (SITRAMP2) was utilized as basis for transportation planning in Presidential Decree (PERPRES54-2008), which contributed to transport and infrastructure planning of DKI Jakarta of central government. Among them, DKI Jakarta has implemented projects of MRT and BRT (Trans Jakarta) priority lanes which STRAMP2 proposed.

Figure 3.28 Modal Share of JABODETABEK

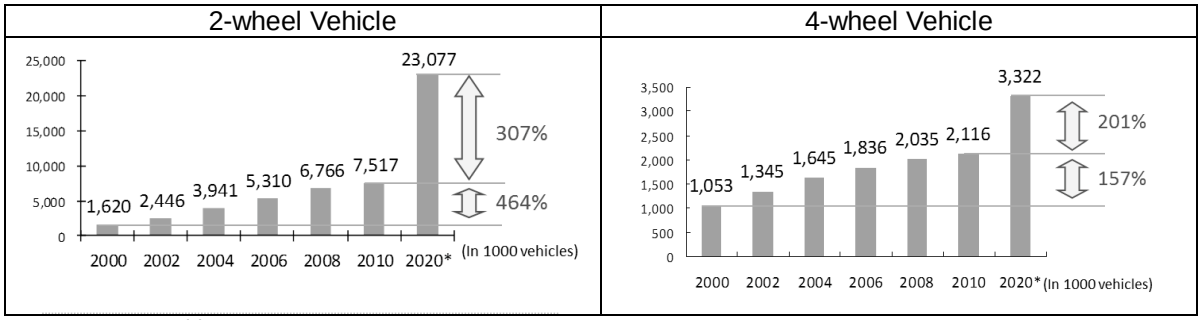


Source: JUPTI

3.96 Due to a rapid increase in private car and motorcycle in particular, congestion is even worse on the other hand. September 2010, the Indonesian government was concerned about this situation, announced a policy priority for traffic congestion in Jakarta metropolitan area. This is aimed at improving traffic in the metropolitan area, coordination and collaboration with relevant ministries. One of policies is to establish "JABODETABEK Transportation Authority (JTA)" as a new administrative organization responsible professionally in the metropolitan area road administration is positioned.

3.97 Toward resolving the metropolitan area traffic problems, JICA Project on JABODETABEK Urban Transportation Policy Integration (JUTPI) was conducted from July 2009 which updated and revised SITRAMP, and supported to establish JTA for improving traffic condition of JABODETABEK.

Figure 3.29 Number of Registered Vehicles in JABODETABEK



Source: Polda Metro Jaya

3.98 MRT North South Line project has been promoted since 2006. In case of the South-North Line with total 23km length (10km elevated, 13km underground), Phase 1 of south (from Lebak Bulus to Bunderan HI, 15.7km) has been implemented, and F/S of Phase 2 of north (from Bunderan HI to Kampung Bandan, 7.8km) and F/S of East-West Line have been completed.

6) Infrastructure

(1) Sewerage

(i) Current Situation

3.99 Following table shows outline of sewerage in DKI Jakarta.

Table3.21 Outline of sewerage in DKI Jakarta

Items	Present Status	Note
[Wastewater]	Only Setiabudi WWTP is now operated and under the construction for facility expansion	
(1) Start of Operation	Year 1991	Combined with Flood control basin
(2) Service Population	-	
(3) Treated Wastewater	28,000m3/day (Design Capacity)	Aerated Lagoon
(4) People with Sanitation	Breakdown of sanitation in the DKI Jakarta; Sewerage system (2%), Individual Treatment System (25%), Septic Tank (63%), Others [Pit Latrine etc.] (10%)	
[Storm Water]		
(1) Start of Operation	Year 1973	Formulation of “Master Plan for Flood control and Urban drainage”
(2) System	Separate type（Basic Policy）	At present, wastewaters are discharged to existing channels without treatment.
(3) Return period	（Design Target） Small Channel: 5 year Small River: 25 year	Capacity of existing small drainage channels: 2year

Source: JICA Study Team

(ii) Sanitation System

3.100 Current situation of sanitation in DKI Jakarta is shown below. Coverage ratio of sewerage system is only 2% and many septic tanks are under inadequate O&M. These situation causes deterioration of sanitation and water environment in public water body.

Table3.22 Current Situation of Sanitation in DKI Jakarta

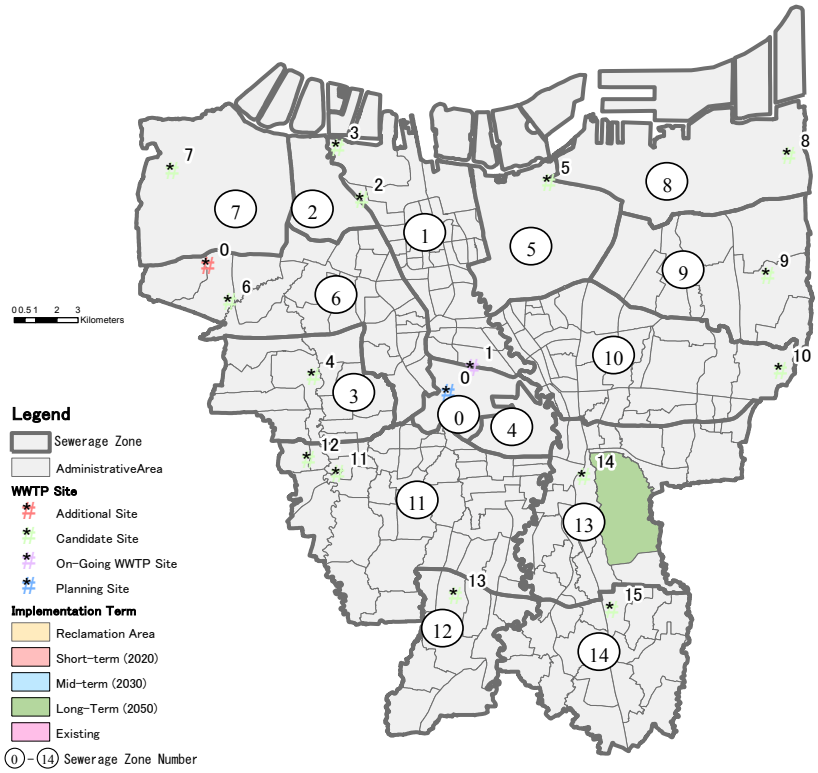
No.	Type	Population incl. Floating Pop. (PE)	Unit Wastewater (LCD)	Wastewater (Daily Average) (m^3/day)
1	Sewerage System (off-site)	168,000	150	252,000
2	Individual Treatment Plant (off-site)	3,345,000	150	5,017,500
3	Septic Tank (on-site)	8,567,000	150	12,850,500
4	Open Defecation	1,300,000	150	1,950,000
	Total	13,380,000		20,070,000

Source: The project for capacity development of wastewater sector through reviewing the wastewater management master plan Final Report (2012, JICA)

3.101 “The project for capacity development of wastewater sector through reviewing the wastewater management master plan (2012, JICA)” have prepared sewerage master plan for DKI Jakarta. In this master plan, it is suggested that sewerage system should be used in combination with On-site treatment system for effective development as a basic policy.

3.102 Treatment districts of sewerage system in DKI Jakarta are shown below. Treatment districts include total 14 zones. Zone No1, No6 are priority districts included in short-term development plan and, as described in “Note” of the figure, feasibility studies of each district have been conducted already by JICA.

Figure3.30 Development Plan by Sewerage Zone in DKI Jakarta



Note)

[Zone 1] The Preparatory survey for PPP Infrastructure Project, Sewage Treatment Plant Project in DKI Jakarta,2012,JICA

[Zone 6] The Preparatory survey on DKI Jakarta Sewerage Development Project, 2013,JICA

Source: The project for capacity development of wastewater sector through reviewing the wastewater management master plan Final Report (2012, JICA)

3.103 Design sewage flows by sewerage zone are shown in following table.

Table3.23 Design Sewage Flow

Implementation Plan	Sewerage Zone No.	Design Flow (m^3/day) [Daily Average]	Design Flow (m^3/day) [Daily Maximum]
Short-term	1	198,000	264,000
	6	235,000	313,000
Middle-term	4,5,8 & 10	47,000～249,000	62,000～331,000
Long-term	2,3,7,9,11,12,13&14	24,000～250,000	32,000～337,000
Total		1,999,000	2,665,000

Source: The project for capacity development of wastewater sector through reviewing the wastewater management master plan Final Report (2012, JICA)

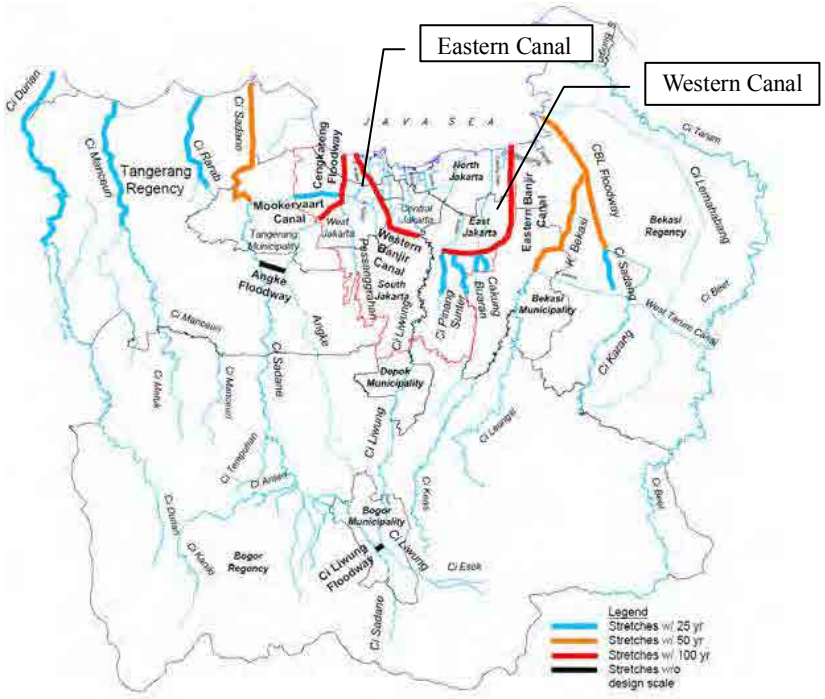
(iii) Drainage

3.104 Ministry of Public Works formulated “Master Plan for Flood control and urban drainage for DKI Jakarta” at 1973 supported by technical assistance of Holland. This master plan set out safety level of flood control as return period 100 years, and planned construction of western canal and reconstruction of eastern canal which were constructed in 1918. However, these plans for western and eastern canal didn’t complete due to difficulty of land acquisition. In addition, due to expansion of urban area, master plan of flood control for Jakarta metropolitan area was required. JICA conducted the study on “Flood management project in JABODETABEK” in 1995~1997 and formulated master plan for flood control.

3.105 Based on this master plan, project for development of main drainage facilities had started but still stopped or not completed due to difficulty of land acquisition and opposition of stake holders.

3.106 There are about 202 holding pond for run off control in DKI Jakarta and these ponds are used for water resource, flood control, and landscaping. Capacity reduction of these ponds is endangered recently due to reclamation by urban development.

Figure3.31 Master Plan for Flood Management in JABODETABEK,1997



Source: Basic Study on the Institutional Revitalization Project for Flood Management in JABODETABEK Summary Report, 2006, JICA

3.107 Jakarta metropolitan area has developed on alluvial plain facing Java Sea and is originally fragile for flood damage. Due to delay of flood control facility development, large scale flood have arisen every 5 years approximately. Flood damage in central area of DKI Jakarta at 2013 is still fresh in our minds.

3.108 Ministry of Public Works have prepared drainage master plan in DKI Jakarta for urban drainage system development in which drainage facilities such as small canals, channels and pumping stations are planned with return period 25 years as safety level of flood control.

3.109 JICA has conducted "The Institutional Revitalization Project for Flood Management in JABODETABEK" for Ci Liwung River which caused flood damage at 2013 (The project ended at October 2013). This project promoted comprehensive flood control which includes 1)facility development such as construction of channels and pumping stations, 2) installation of run-off control facility such as storage and infiltration system, 3) regulation of land development, 4) preparation of hazard map for flooding, for improvement of safety level of flood control. Target of this project is to improve safety level of flood control for return period 50 years by implementation of comprehensive flood control.

(iv) Issues

3.110 Based on the interview to related agency and project, issues on sewerage are summarized below.

(a) **Early development of sewerage system**: Water pollution is one of the most serious problems in DKI Jakarta. Low coverage ratio of sewerage system, 2% at present, is one of the reasons for water pollution. Since priority of environmental infrastructure development is lower than that of other infrastructures such as road, housing and transportation, development of sewerage is postponed. Domestic wastewater is discharged to existing drainage without enough treatment in present condition. Technical support by Japan is expected for development of separate system, interceptor sewer and automatic monitoring system for water quality.

(b) **Appropriate O&M for septic tank**: World Bank conducted investigation for current status of septic tanks. Result of the investigation reported that only 5% of existing septic tank is under appropriate O&M condition in which sludge is withdrawn periodically. There is no related project for night soil treatment, such as construction of treatment plant, by Indonesian side.

(c) **Early improvement of river**: In Ci Liwung River basin in where large scale flood arose at 2013, redevelopment of main canals called western canal and eastern canal are planned for improvement of safety level of flood control for return period 50 yeras by 2016 with government budget. However, progress of the project is slow due to difficulty of land acquisition.

(d) **Inadequate O&M of existing drainage facilities**: Illegal dumping of solid waste to existing drainage causes inundation by clogging of channels. Since this problem is closely relative to solid waste management, experience and know-how of Yokohama city, as a local authority, may be utilized from viewpoint of holistic assistance. Meanwhile, DKI Jakarta has already urbanized and it is difficult to acquire lands for development of river, canal and installation of run-off control facilities. Thus, it will be effective to control and assist surrounding cities at upstream of DKI Jakarta for comprehensive flood control. Liaison council of DKI Jakarta with surrounding cities for

flood control has already established.

(e) **Complicated project implementation**: Project of sewerage and sanitation are managed by a lot of agencies as shown in following table. Scope of responsibility for project management by each agency is not clear and improvement of organization structure is desired for centralization of authority.

Table3.24 Total System of Management and Supervision for Sewerage and Sanitation Sectors

Management and Supervision		Storm water	Wastewater	
			Off-site	On-site
Ministry of Public Works	DKI Jakarta	○ (main rivers)	○	○
	Others	○	○	○
DKI Jakarta	BPLHD		○	○
	DPU	○(branches, canals)		
	PD PAL JAYA		○	○
	DK			○

Note: BPLHD: Regional Environment Management Board, DPU: Public Works Agency of DKI Jakarta, PD PAL JAYA: Public corporation, DK: Cleansing Agency of DKI Jakarta
Source: The project for capacity development of wastewater sector through reviewing the wastewater management master plan Final Report (2012, JICA)

(v) Overview of Sewerage and Sanitation in DKI Jakarta

3.111 Coverage ratio of sewerage in DKI Jakarta is only 2% at present and there is no large scale sewerage system for urban area. Sewerage projects for urban area have already prepared and early implementation of the projects is expected. There will be many assistance needs such as facility construction, O&M of system, and project management when the projects start because it will be an initial project of sewerage for DKI Jakarta.

3.112 As regards drainage system, flood/inundations have frequently arisen in urban area and development of drainage facilities is required. However, there are still many problems for project implementation such as difficulty of land acquisition and opposition of stake holders and it should be considered from this time.

3.113 Under the circumstances, comprehensive flood control project, in which not only 1) facility development, but also 2) installation of run-off control facility, 3) regulation of land development, and 4) preparation of hazard map for flooding are planned, have already started and it is expected to promote such projects furthermore in future.

(2) Environmental / Solid Waste Management

(i) Laws and Regulations on Environmental / Solid Waste Management

3.114 Table below shows the laws and regulations on the environmental / solid waste management in Indonesia and DKI Jakarta.

Table 3.25 Laws and Regulations on Environmental / Solid Waste Management

	Name	Contents of Regulation
Laws and regulations on environmental management	Law No. 32/2009 on Environmental Protection and Management (Original Law No. 23 / 1997)	An original law on environmental and solid waste management was enacted in 1982. And the law was revised in 1997 as Law No. 23/1997 and was updated further in 2009 as Law No. 32/2009. The law regulates strengthening the environmental regulatory and penalty system, enhancement of dispute resolutions for business activities and the disclosure of environmental information to public. The law covers 11 chapters and 52 clauses consisting of general rules, principle, purpose, target, right and duties, role of society, power and authority on environmental management, protection of environmental function, legal compliance, dispute resolution, investigation, punitive clauses and transitional measures on

		environmental management. The law has the following legal features; • Enhancement of environmental regulation for business activities • Strengthening of punishment • Enhancement of regulation on resolution of disputes caused by environmental issues • Introduction of rights of individuals to free access to environmental information • Definition of solid waste (general or hazardous waste)
National Standards	National standards on air, water quality and measures toward global warming	The national standards on air, water quality, noise and measures toward global warming are shown as below; • Government Regulation No.41/1999 on Air Pollution Control: Uniform environmental standard throughout the country • Ministry's (Ministry of Environment) Decree No. 13/1995 on Emission Standards for Stationary Sources • Decree of the State Minister of Environment of Republic Indonesia No.141/2003 on the ambient air quality in DKI Jakarta: The decree was enacted to reduce emission loads from new mobile sources including adoption of Euro II for procurement of new vehicles • Government regulation No. 82/2001 on Water Quality Management and Water Pollution Control: Water quality standards for surface water (lake, rivers) and groundwater • Decree of the state minister of environmental affairs No.51/1995 on the wastewater quality standard for industrial activities • Decree of the state minister for environment of the republic of Indonesia (No. 48/1996) concerning noise level • Decree of the state minister for environment of the republic of Indonesia (No. 49/1996) concerning vibration level • Decree of the state minister for environment of the republic of Indonesia (No. 50/1996) concerning vibration offensive odor
Laws and regulations on solid waste management	Act on Waste Management No. 18 /2008	Law No.23/1997 regarding environmental protection and management as mentioned before regulates the definition of solid waste into two (2) types of daily waste (general waste) and processing waste (industrial waste). The processing waste containing hazardous matters was classified as B3 waste pursuant to the government regulation No.18/1999 regarding hazardous waste management and therefore the strict management has been required. The daily waste has not been regulated for a long time. However, the general waste was regulated by the Law No. 18/2008 on Waste Management after the submission of its draft law in 2006 by Ministry of Environment. Law No.18/2008 requests all waste generators of household waste and other general waste a waste reduction to minimum level as measures for the increasing waste amount and types of waste caused by human activities such as the increase of population growth and also by the change in consumption pattern. To provide available methods for segregation of solid waste was imposed to all waste generators of the person in charge of communal residential building, other areas and facilities (regional government) pursuant to the law No.18/2008. In addition, the law regulates that local governments are obliged to close existing open dumpsites within five (5) years from the enactment of the law.
	Government Regulation No. 81/2012 regarding Household Solid Waste and Household-like Solid Waste Management	The regulation aims at protection of environment and sanitation, and utilization of solid waste as resources pursuant to the law No.18/2008 which was already mentioned above. The law generally classifies solid waste management into two (2) approaches, "Reduction of waste" and "Treatment of waste". The former promotes 3Rs (Reduction, Recycle and Reuse), and the latter, one hand, regulates five (5) processes of separation, recovery, transport, intermediate treatment and final disposal. Pursuant to the law, local government has a mandatory obligation to install a TPS (*Tempat Pembuangan Akhir*: Temporary Storage Area) and TPS-3Rs (*Tempat Pembuangan Akhir*: or Temporary Storage Area in which 3Rs are required) at their community levels. The law also regulates that any local government shall have duties to construct and operate TPA (*Tempat Pebgelolaan Akhi*: final disposal facility) and that the local government has to prepare development plans of these TPAs

		through taking 1) geology, 2) hydrogeology, 3) slope stability, 4) impacts on air flight transport at nearby airports, 5) impacts on protection areas and 6) past flood damages into consideration. The law also regulates that the future final disposal facility shall be developed as a sanitary landfill installed with fence, truck scale, impermeable liner, leachate treatment facility and soil covering, not as an open dumping landfill, which shall not be allowed to be developed hereafter. Waste management of E-waste such as discarded home electric appliances or electronics device is also regulated by the law that their manufacturers shall have the duties to carry out recycling or reuse their waste to respond to the regulation appropriately. The industrial waste generated from industrial areas is also covered by the law.
	Other relevant laws and regulations	Other laws and regulations such as Law No.24/1992 or Law No. 26/2007 regarding spatial plan, Law No.22/1999 or No. 32/2006 regarding local autonomy and Law No. 32/2009 regarding on environmental protection and management as already mentioned above, also have relations with solid waste management. The law on spatial plan regulates that actual establishment of urban plan or implementation of its urban development should require improvement of environment and a sustainable development as a same time. The law on local autonomy regulates that the area-wide solid waste management including development of sanitary landfill extending cities and regency's jurisdiction shall be any state government's mandatory obligation. The followings are the relevant laws and regulations in addition to those which were already mentioned above; • National Regulation No. 21/PRT/M/2006 on the National Policy and Strategies for the Development of Waste Management System • Presidential Regulation No.5/2010 concerning RPJMN (Medium Term National Development Plan, 2010-2014: Target collection and transport level: 75%, Improvement of final disposal site) • Presidential Regulation No.13/2010 concerning Government Cooperation with Business Entities: Promotion of PPP for development of transfer station and final disposal facilities • Regulation of Home Affairs Minister No. 33/2010 concerning Guidelines for Waste Management: Local government's duty of establishment of waste reduction and waste management plan • Regulation of Public Work Minister No. 14/2010 concerning Minimum Services Standard of Public Work field and Area Spatial: Performance indicators and targets for waste management in 2010 – 2014, Target reduced waste amount by 20% by the year 2014, Target waste transportation level 70 % in 2014[1]. • Law No.33/2004 concerning fiscal balance between central and regional government
Ordinance	Ordinance of DKI Jakarta	The followings are the ordinances of DKI Jakarta regarding environmental and solid waste management. • Ordinance on cleansing works in DKI Jakarta (No. 5/1988) • Technical guideline on solid waste collection in DKI Jakarta (Governor decree No.1453/1988) • Governor decree on solid waste management in DKI Jakarta (Governor decree No.1281/1989) • Governor decree on organizational operation in DKI Jakarta (Governor decree No.10/2008)

Source: JICA Study Team

[1] Surabaya City succeeded in waste reduction beyond 30 % from 1,819 ton/day in 2005 to 1,241 ton/day of the delivered waste amount at its final disposal site in 2010 through introduction of composting pf household kitchen waste at community level by using Takakura method which was developed by IGES (Institute for Global Environmental Strategies), KITA, IGES Kitakyushu Urban Center, March, 2012)

(ii) National Policy, Program and Regional Plan

3.115 The national policy and program on environmental and solid waste management in Indonesia is shown as in Table below.

Table 3.26 National Policy and Program on Environmental / Solid Waste Management

National Policy, Plan and Program	Contents
Priority plan on environmental management (Ministry of Environment)	The following seven (7) programs on environmental management were established toward their actual implementation. • Capacity development of local governments toward implementation of better environmental oriented administration: enhancement of local governments' capacity on environmental management, especially toward implementation of environmental administration to comfort to public needs • Capacity development of public and promotion of public education: promotion of capacity enhancement and public education for public to take their initiatives in solution of local environmental issues • Reduction of pollution loads from stationary emission source: enhancement of law enforcement toward reduction of pollution loads • Reduction of pollution loads from mobile emission source: regulation of exhaust gas of automobiles, prevention of illegal mining of mineral sources, prevention of illegal logging, appropriate management of household waste, reduction of pollution load from mobile emission source • Protection of natural environment: prevention of forest fire, protection of tropical rainforest, conservation of lake water environment, protection of coral reef • Enhancement of information system: gathering environmental information for development of baseline database, identification of environmental hot spots, enhancement of information system for their disclosure to public
Environmental Strategy Plan (2004 to 2009, 2010 to 2014)	The environmental strategy for 2004 – 2009 was established to improve national environmental quality for Indonesia people by introducing the following missions based on Ministerial Decree of Ministry of Environment No.4 / 2005 through Ministry of Environment as a reliable organization toward the realization of sustainable development; • Implementation of management policy of natural resources and their environment which supports sustainable development • Formulation of fair and sustainable coordination and partnerships among stakeholders in relation to extraction of natural resources and the environmental efficiency • Realization of prevention of natural resources and environmental damages and pollutions The environmental strategy for 2010 – 2014, on one hand, aims at sustainable development thorough Ministry of Environment (MOE) by prioritizing "Green Economy" and as a trusted and active organization.
Measures for Air Pollution (Blue Sky or Langit Biru Program)	This program (*Langit Biru* program) was initiated by Ministry of Environment (MOE) in 1992 to improve air pollution in Indonesia's five (5) largest cities: Jakarta, Bandung, Semarang, Surabaya, and Medan, and has continued up to current date. The program aims at 1) mandatory compliance with emission standards, 2) promotion of low-emission (of air pollutants) fuel, low emission technology, process of transfer from the use of conventional fuel to those of low emission and application of the approach of these technology. The program consists of two (2) phases, Phase 1 (1992 – 1996) and Phase 2 (1997 -). Phase 1 aims at establishment of an action plan, an introduction of a new regulation for emission control, improvement of institutional capacity, preparation of EIA for the potential air pollution by implementation of development projects, formulation of monitoring plan of air quality environment and creation of social awareness. In phase 2, on one hand, a management program on two emission sources of mobile and stationery was formulated. The program covers improvement goals and their application range of the program. However, any specific action guideline toward improvement of air pollution is not clearly indicated.

Water Quality Improvement Policy	The water quality management or water pollution control management is regulated by the government regulation No. 82/2001. The regulated clauses on the administrative authorities for their management for water quality are shown as below; • Central government has jurisdiction over the water quality management in case of water body extending state or national border • State government has jurisdiction over the water quality management in case of water body extending several regencies or cities • Each regency or city has jurisdiction over the water quality management in case of water body inside the regency or city. Above regulation of No. 82/2001 also covers the following water quality management; • Mandatory water quality inspection by local government (Clause 13): Inspection frequency as once a half year and report to the minister of MOE • Polluter pay system (Clause 24): Any actor which discharges its polluted effluent into wastewater treatment facilities provided by local governments shall has a mandatory obligation to pay discharge charge whose rate is regulated by the local governments. • Mandatory self-monitoring on necessary measures on discharge of its waste water (Clause 34): Any industry entity which discharges its polluted effluent into any water sources shall have a duty to submit a report on the measures on his waste water discharge together with his monitoring. • License for discharge of effluent (Clause 40): The plan or project whose effluent is discharged to water sources is required to obtain a license of its discharge
River Water Quality Improvement Program (PROKASIH, SUPERKASIH)	River water quality improvement program named "PROKASIH" (*Program Kali Bersih*: Clean River Program) was launched in 1989 to improve river water quality nationwide in Indonesia. Afterwards, the program was renewed to "SUPERKASIH". The program was formulated as a result of the mutual collaboration between the central government (Ministry of Environment) and local governments. The program aims at water quality improvement through water quality monitoring and concluding an agreement with business entities or industrial proponents in major rivers in nationwide. Water quality monitoring was conducted for five (5) parameters, namely, DO, pH, BOD, COD, SS (Suspended Solid) at 77 rivers and 600 factories and business entities nationwide in 17 states in Indonesia.
Solid Waste Management Policy in National Mid-term Plan (RPJM)	The improvement of solid waste management is one of the national goals in environment sector based on the previous national mid-term plan (RPJM: *Rencana Pembangunan Jangka Menengah*) 2004 - 2009. The promotion of public participation in waste separation at generation source or 3Rs (Reduce, Reuse, Recycle) activities is also covered in the plan as the prevention of pollution and environmental degradation. RPJM has three (3) programs on the SWM on general waste, 1) program targeting at the SWM at community level, 2) program through capacity development and 3) program aiming at upgrading synergistic effects by the improvement through the collaboration of solid waste and sewerage management. The program targeting at community is to promote 3Rs, construct recycle centers at large cities, internalization of the social costs in SWM and sewerage management into society, carrying out model projects for the development of organic farming through expanding the composting in large or middle cities. With regard to capacity building, the laws and regulations were reviewed and a new law on waste management on general waste (household waste) was decided to be enacted. A policy, strategy and plan in national level on treatment of general waste were decided to be established for building a model administrative management in local government with regard to general waste and waste water. In the RPJM 2010 -2014, on one hand, environmental and disaster management become a new challenge as one of eleven (11) national priorities. The management covers the challenges on climate change, prevention of environmental degradation, early-warning system and reduction of natural disaster. Ministry of Environment (MOE) established a strategic plan covering the following policies; • Promotion of prevention of water, earth, air environment and biodiversity • Promotion of environmental regulation based on environmental capacity • Consistent improvement of enforcement capacity of environmental laws • Promotion of community empowerment and community participation

	• Capacity building on environmental management for the human resources and relevant organizations • Improvement of environmental data, quality and access to these data • Development of substitution finance source for environmental management The following prioritized actions were decided on a priority base to be implemented from above policies on solid waste management; • Appropriate management of hazardous matters and waste in mining, energy, oil and gas industries • Appropriate management of hazardous matters and waste in manufacturing, agro-industry and service business • Appropriate administrative control of hazardous matters and waste
Public Work Ministry Decree No.21/PRT/M2006	Ministry of Public Works (*Kementerian Pekerjaan Umum*: PU) established a public work ministry decree No. 21/PRT/M2006 on National Policy and Strategy on the development of waste management system. The outline of the decree is shown as blow; [Numerical Goal targeting at 2010] • 20 % reduction of waste amount[2] • Provision of SWM service to 60 % of population at minimum [Policy] • Reduction of waste discharge at generation source • Promotion of activated participation of public and private sectors in SWM as important partners • Improvement of service area and its quality of solid waste management • Capacity development of organizations and improvement of laws and regulations • Securing substitution finance source for environmental management The promotion of 3R is clearly regulated in the decree and pilot projects on 3R have been carried out nationwide since 2007. One of the projects is the project targeting at SWM at community level, where PU bears an initial cost for procurement of equipment and followed by a monitoring of the 3R activities through promotion of public education and organization to obtain public collaboration. The contents of the actual projects are home composting, recovery of recyclable materials at community level. The pilot projects are still ongoing and are expected to be increased.

Source: JICA Study Team

(iii) Regional Plan on Solid Waste Management in DKI Jakarta

3.116 The solid waste management plan in DKI Jakarta was established in 1987 and had been implemented to 2005. The details of the plan are shown in Table below.

Table 3.27 Solid Waste Management Plan of DKI Jakarta

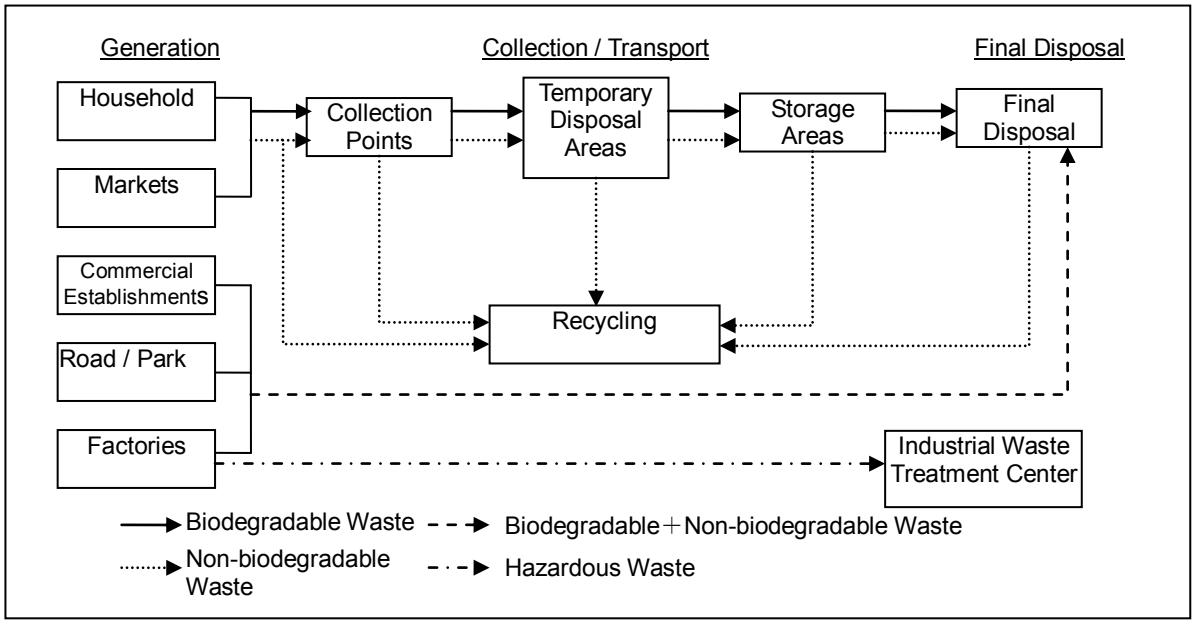
Aspect	Contents
Technical Aspect	• Efficient collection and transport system of solid waste through mechanical and efficient allocation of TPS (Temporary Storage Area or Temporary Collection Point) • Effective road sweeping system through improvement of collection frequency and collection methods • Final disposal of solid waste in hygienic manners through development of sanitary landfills
Administrative or Operational Aspect	• Appropriate time management, waste amount measurement control in collection and road sweeping through the maintenance of vehicles and equipment • Enhancement of capacity of transport management of solid waste
Organizational Aspect	• Enhancement of capacity of cleansing department
Financial Aspect	• Enhancement of financial management including improvement of collection system of garbage fee
Legal Aspect	• Enhancement of legal system including private sectors' involvement
Promotion of Public Participation in SWM	• Development of information system and public education or development of public participation of local residents through cleanup activities in local communities

Source: Solid Waste Management Plan of DKI Jakarta

[2] Refer to footnote 1

3.117 According to the plan, for the household waste, a primary collection system was conducted at community level through using of manual carts by community associations (RT：Rukun Tetangga) or neighborhood association (RW: Rukun Warga) and was followed by the collection service of DKI Jakarta. As for the commercial waste, on one hand, they were collected and transported by the collection service of DKI Jakarta and private companies. Industrial waste was treated in principle by each industry by their own responsibilities.

Figure 3.32 Conceptual SWM System pursuant to SWM Plan (1987) in DKI Jakarta



Source: Cleansing department of DKI Jakarta

(iv) Current Condition of Environmental and Solid Waste Management

3.118 The environmental management in DKI Jakarta is conducted by environmental management agency (BPLHD: Badan Pengelola Lingkungan Hidup Daera, Provinsi DKI Jakarta). The major tasks of BPLHD is establishment of environmental management plan, administrative guidance, handling of complaints from residents, examination of EIA (AMDAL) reports and periodical monitoring of air and water quality. BPLHD conducts water quality monitoring of public water body of sea water, rivers and groundwater.

3.119 The agency manages 70 monitoring points of 32 rivers and drainage canals. According to the monitoring results in 2012, the concentration of phosphate, BOD, COD and E. Coli in Ciliwung and Sunter Rivers exceeded the environmental standards, which show that typical rivers are extremely polluted. One of the reasons of the water pollution is caused by the insufficient sewerage service coverage of only 2 % of the total population.

3.120 As for the air quality monitoring, BPLHD has twenty five (25) monitoring stations, of which 5 stations have automatically recording system. The monitoring results in 2012 show that the concentration of SO_2, NO_2 and Pb fell in the range of the environmental standards in several parts of the monitoring stations but that those of TSP (Total Suspended Particles) and O_3 exceeded their environmental standards in their all parts.

3.121 As a financial aspect, annual budget of 50 Billion Rupiah is allocated to the environmental management, which is laid in lower priority compared to those of the infrastructure development such as roads and housings. This shows that the amount is not

sufficient to carry out appropriate environmental management.

(v) Current Condition of Solid Waste Management

3.122 The solid waste management in DKI Jakarta is carried out by Cleansing Agency (Dinas Kebersihan) in DKI Jakarta. The major task of the cleansing agency is to carry out overall solid waste management, establish a regular solid waste management plan, formulate a facility and equipment plan on SWM and their actual implementation. The agency is responsible for five (5) districts of north, central, west, east, and south of DKI Jakarta. As for collection and transport operation, the agency has cleaning offices in each district for the operation works of road sweeping, collection / transport and recycling activities. At the sub-district level under each cleaning offices, the agency manages road sweeping, collection and waste tariff collection.

3.123 The waste amount of DKI Jakarta in 2011 is shown in Table 3.2.11. Table 3.2.11 shows that the collected waste volume is 25,065 m3/day (equivalent to approximately 5,200 ton/day when unit weight of waste is estimated as 0.21 ton/m3) for the generated waste volume of 28,515 m3/day (equivalent to approximately 6,000 ton/day), which accounts for approximately 88 % collection ratio for the waste generation amount in case of DKI Jakarta[3].

Figure 3.33 Generation and Collected Volume of Municipal Solid Waste in DKI Jakarta in 2011

No.	Area	Generation Volume (m^3/day)	Collected Volume (m^3/day)	Non-Collected Volume (m^3/day)
1	North Jakarta	5,479	5,479	0
2	Central Jakarta	4,519	4,517	2
3	East Jakarta	6,490	5,526	964
4	West Jakarta	5,696	5,642	54
5	South Jakarta	6,331	3,901	2,430
Total		28,515	25,065	3,450
Ratio (%)		100	87.9	12.1

Source: Cleansing Agency of DKI Jakarta

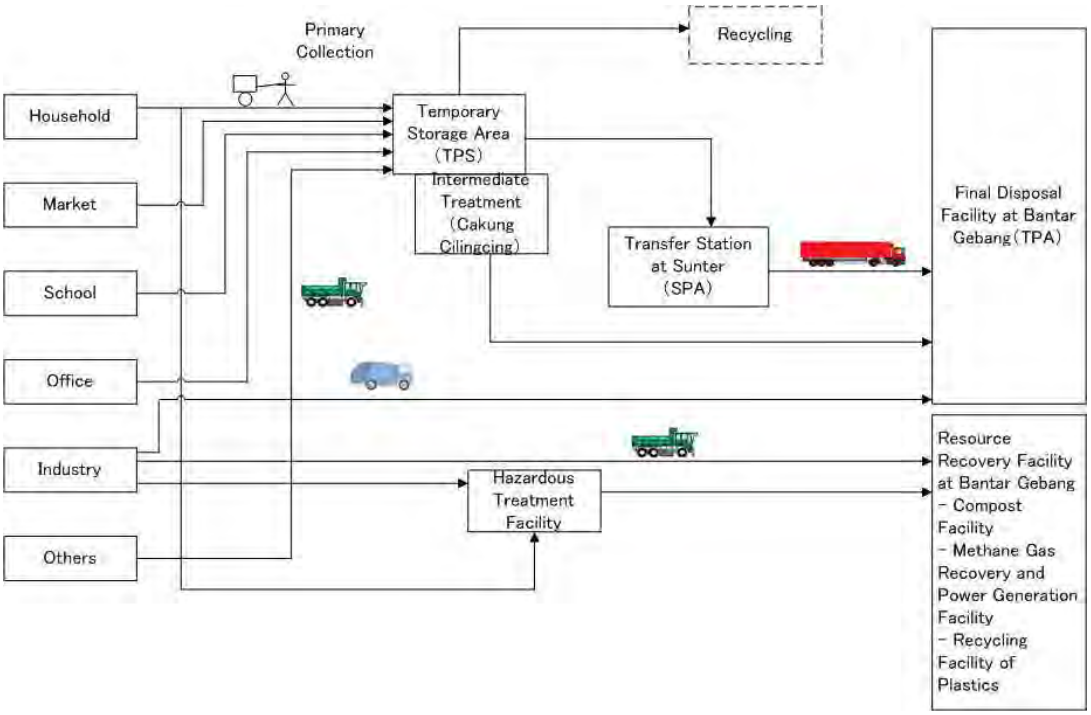
3.124 The basic flow of the waste treatment in DKI Jakarta is as follows:

- Primary Collection at Community: The collection of the household waste at community level is carried out through using hand cart by a community association (RT: *Rukun Tetangga*) or a neighborhood community association (RW: *Rukun Warga*) and transported to each temporary storage area (TPS: *Tempat Pembuangan Sementara*) where the collected waste is transported the existing final landfill by the cleansing agency in DKI Jakarta .
- Transport: The waste at each TPS is transported to the Sunter Transfer Station (treatment capacity: 1,500 ton/day) which was constructed through Japan Yen Loan project in 1995 or directly transported to the final disposal facility (TPA: Tempat Pemuangan Akhirnya) in Bantar Gebang in West Jawa by the cleansing agency or private collection service providers.
- Intermediate Treatment: A sorting facility and a compost facility of biodegradable waste (capacity: 500 ton/day) is operated at Cakung-Cilincing in East Jakarta.
- Final Disposal: A final disposal facility (TPA) at Bandar Gebang in Bekasi is operated under concession agreement by a private company of PT. Godang Tua Jaya for the concession of 15 years since 2008. A compost (treatment capacity: 70 ton/day), a methane gas recovery and generation facility (power

[3] It is estimated that the minimal collection ratio (61.6%) of South Jakarta arose from its least fleet number (139) of collection vehicles compared to those of other areas as of 2009(151, 155, 184 and 147 of East, Central, West and North Jakarta, respectively), Cleansing Agency of DKI Jakarta

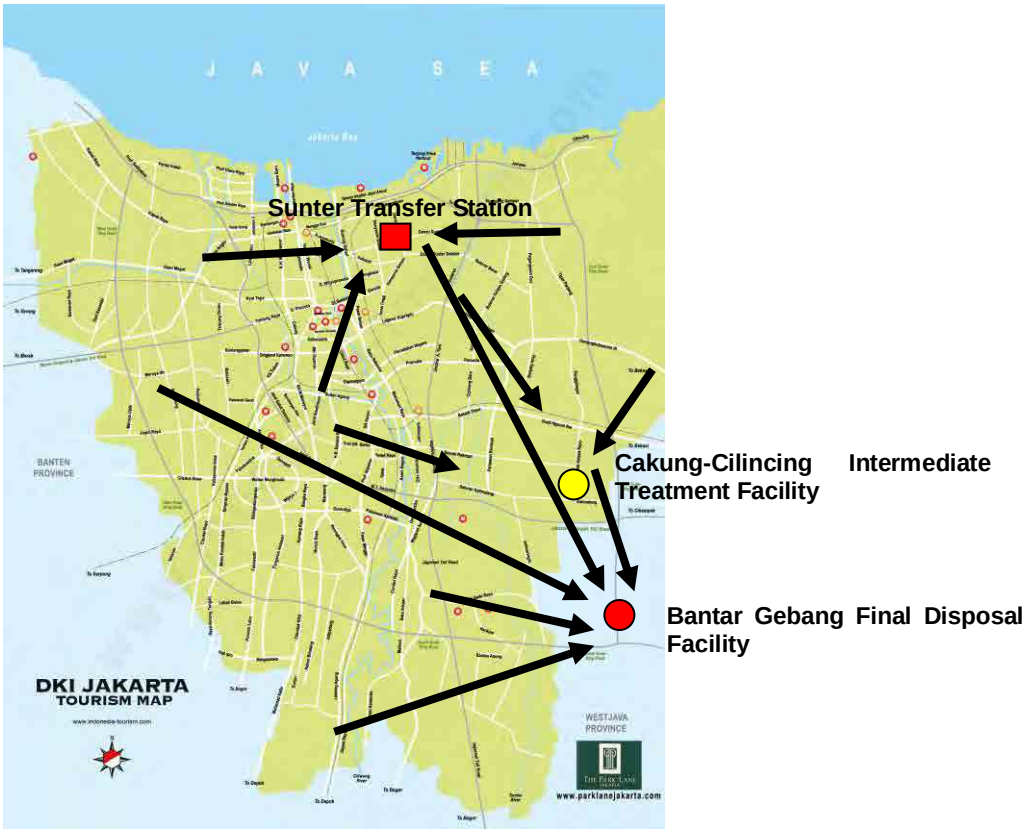
generation: 10 MW) and recycling facility of recovered plastics (treatment capacity: 4 ton/day) are also installed and operated in parallel to the final disposal facility by the private company.

Figure 3.34 Flow of Solid Waste Collection in DKI Jakarta



Source: JICA Study Team

Figure 3.35 Solid Waste Facility Distribution in DKI Jakarta



Source: JICA Study Team

Table 3.28 Solid Waste Treatment Facility in DKI Jakarta

	Sunter Transfer Station	Cakung Cilingcing Intermediate Treatment Facility	Bantar Gebang Final Disposal Facility
Jurisdiction Government	DKI Jakarta	DKI Jakarta	Bekasi City, West Jawa
Outline of Facility	Transfer station • Capacity : 1,500 ton/day • Method: Compaction type transfer system	Intermediate treatment facility • Receiving capacity : 500 ton/day • Method: Sorting, composting	• Final disposal facility (TPA) : 110 ha • Compost facility : 70 ton/day • Recovery of methane gas and power generation facility : 10MW • Recycling facility of plastics: 4 ton/day
Others	Construction plan of incineration facility at adjacent area (1,000 ton/day): Under tender process		Private company operating above facilities based on concession agreement

Source: JICA Study Team

Figure 3.36 Photos of Solid Waste Management Facilities

Transfer Station at Sunter

Final Disposal Facility at Bantar Gebang

Compost Facility at Bantar Gebang

Methane Gas Recovery and Power Generation Facility at Bantar Gebang

Source: JICA Study Team

(vi) Recycling Activity

3.125 Informal sector such as waste pickers at TPS or TPA is the major actor of recycling in DKI Jakarta. The operation crews of the cleansing agency also pick recycling materials for making up their salaries. Major recyclable materials in DKI Jakarta are plastics, steel, aluminum, cardboard box and glasses, and these are sold to recycling dealers (Processed

plastics at Bantar Gebang is sold to the dealers in Bandung). The biodegradable waste is processed to compost at Cakung Cilingcing or Bantar Gebang, and sold to farmers for profit.

(vii) Financial Situation of SWM in DKI Jakarta

3.126 Cities or regencies are the actors of solid waste management in urban area and they bear the operation / maintenance cost on SWM. A special grant (DAK: Dana Alokasi Khusus) from central government which is allocated by the national budget (APBN: Anggaran Pendapatan dan Belanja Negara) in each ministry is distributed to nine (9) sectors including environment.

3.127 The annual budget of the cleansing agency in DKI Jakarta is shown in Table below, which accounts for 807.2 Billion Rupiah in 2010.

Table 3.29 Annual Budget of Cleansing Agency in DKI Jakarta

Unit in Billion Rupiah

Year	Budget for Direct Expenditure (Materials & Equipment)	Budget for Indirect Expenditure (Salaries , Maintenance, etc.))	Total
2009	552.7	35.8	588.5
2010			807.2

Source: Cleansing Agency of DKI Jakarta (Condition of Solid Waste Management for year 2010 – 2011)

3.128 The collected waste charge for solid waste management service is shown in Table below, where the charge for household waste in primary collection is not indicated because its charge collection is done by communities, not by DKI Jakarta.

Table 3.30 Waste Charge in DKI Jakarta by District and by Generation Source

Unit in Hundred Million Rupiah

District	Household	Shops	Institutional	SMEs	Industries or Factories	Tipping Fee at SPA or TPA	Total
Central	-	1.9	0.4	0.1	3.4	0.0	5.7
North	-	2.1	0.3	0.2	2.0	0.0	4.6
West	-	0.8	0.6	0.3	3.2	0.0	4.8
South	-	1.4	0.3	0.2	2.6	0.0	4.5
East	-	1.8	0.5	0.4	3.5	0.0	6.2
Main Office of Cleansing Agency	-	0.0	0.0	35.8	0.0	42.9	78.6
Total		7.9	2.0	37.0	14.7	42.9	104.5

Source: Cleansing Agency of DKI Jakarta (Condition of Solid Waste Management for year 2010 – 2011)

(viii) Japanese Assistance in Environment and Solid Waste Management

3.129 The past Japanese assistance in environment and solid waste management in DKI Jakarta is shown in Table below. With respect to environmental management, the project for environmental center had been carried out through establishment of environmental management center in 1990s. The solid waste management plan in DKI Jakarta was formulated in 1987, as for solid waste management, a transfer station was constructed by using Japanese Yen loan in Sunter in north Jakarta. In 2012, Jakarta Metropolitan Special Area and Investment Promotion (MPA) Master Plan Study in Indonesia by taking utilization of PPP (Public Private Partnership) approach for their project implementation into consideration was completed, and the solid waste management project (a new landfill development project in Tangerang area) was selected as one of fast track projects.

Table 3.31 Japanese Assistance in Environment / Solid Waste Management in DKI Jakarta

Year	Project / Study	Name of Agency or Company for Implementation or Study
1987	Solid waste management plan in DKI Jakarta	JICA
1991～1993	Environmental center project (1)	JICA
1993～2000	Environmental center project (2)	JICA
1995	Transfer station project in Sunter	ShinMaywa Industries, Ltd.
2012	Study on the waste treatment facility Bot project in DKI Jakarta, the Republic of Indonesia	The Ministry of Economy, Trade and Industry / EX Research Institute Ltd. ARAX Corporation
2012	Jakarta Metropolitan Special Area and Investment Promotion (MPA) Master Plan Study in Indonesia	JICA / Nippon Koei Co., Ltd., Oriental Consultants Co., Ltd. , Mitsubishi Research Institute, etc.

Source: JICA Study Team

(ix) Challenges in Environment and Solid Waste Management Sector

3.130 The challenges in environment and solid waste management in DKI Jakarta are shown as below;

- Quantity of equipment or human resources to be required for environmental monitoring especially for automatic measuring system is not sufficient due to the lack of allocated budget.
- Accordingly, the enforcement of environmental monitoring is not carried out actually to an adequate level for the legal or institutional requirement.
- In solid waste management, the national policy on waste reduction or 3Rs is established in national program, strategy or mid-term plan, but in operational aspect of these goals, the environmental or public education is not implemented actually to a satisfactory level.
- Illegal dumping or littering of municipal waste is found in rivers or drainage canals and this will mean that the collection service of municipal solid waste does not reach into every urban area, and the improvement through the collaboration with other sector such as urban development plan, urban drainage and road development will be one of potential options for solution of these issues.
- The existing equipment such as collection / transport vehicles is extremely deteriorated and require for the renewal.
- The facility development plan of solid waste treatment which takes the topographical balance of DKI Jakarta into account will be necessary for the efficient collection, transport and final disposal system.
- Taking a great amount of waste reduction into consideration in large urban city, a drastic reduction of the municipal solid waste is an urgent and crucial concern in DKI Jakarta where its land use is limited, and the development of the intermediate treatment facilities such as incinerators (waste-to-energy) will be one of influential options.

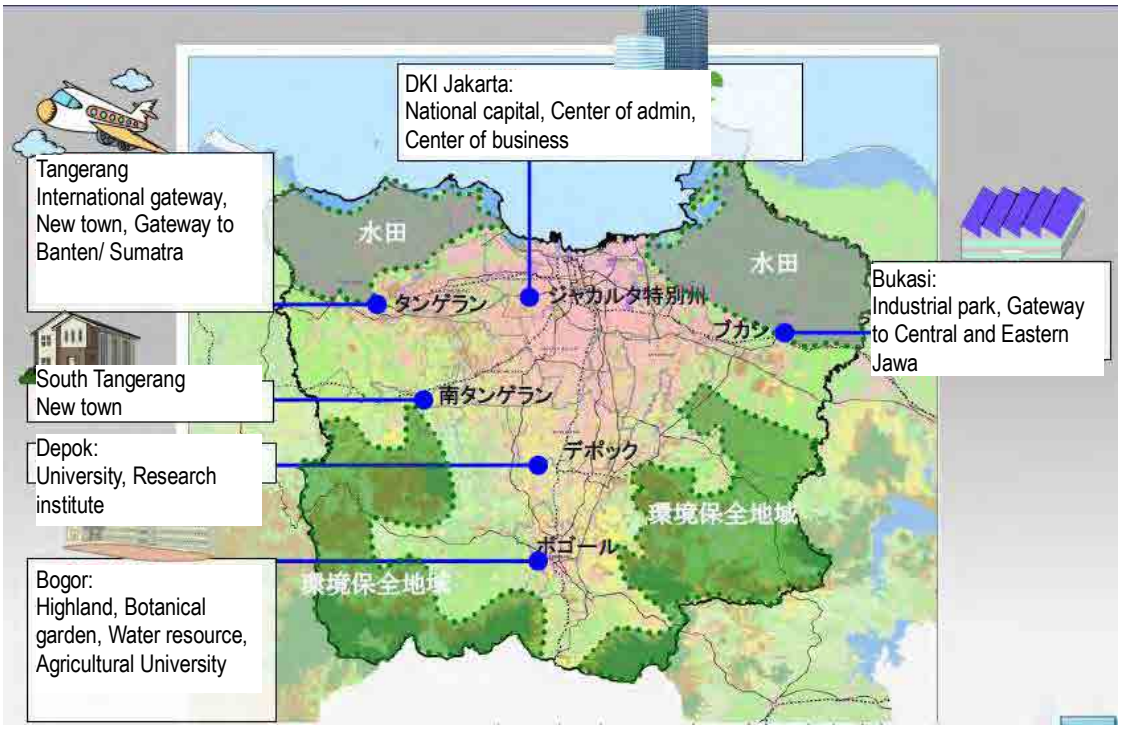
7) Urban Planning and Urban Development

3.131 The Metropolitan Priority Area (MPA) in JABODETABEK is an important element as a part of the Master Plan for the Acceleration and Expansion of Indonesia Economic Development (MP3EI), which has been discussed with private sectors and local government intensively.

3.132 In the approved Master Plan, 45 priority projects which will be completed till 2020, and 18 fast track projects which will be commenced till the end of 2013 are indicated. Among the fast-track projects, 5 projects including MRT construction project and Cilamaya new international port construction project in West Jawa are defined as symbolic project with public-private-partnership of MPA.

3.133 DKI Jakarta is a national capital as a center of administration and business, and various infrastructure projects such as MRT, road network development, urban redevelopment, urban utility projects (water supply, sewerage, solid waste, flood control), new airport, new industrial park, and smart grid development.

Figure 3.37 Regional Characteristics under MPA Vision



Source: Presentation of 3rd MPA Steering Committee Meeting

Figure 3.38 Vision 2030 for JABODETABEK MPA

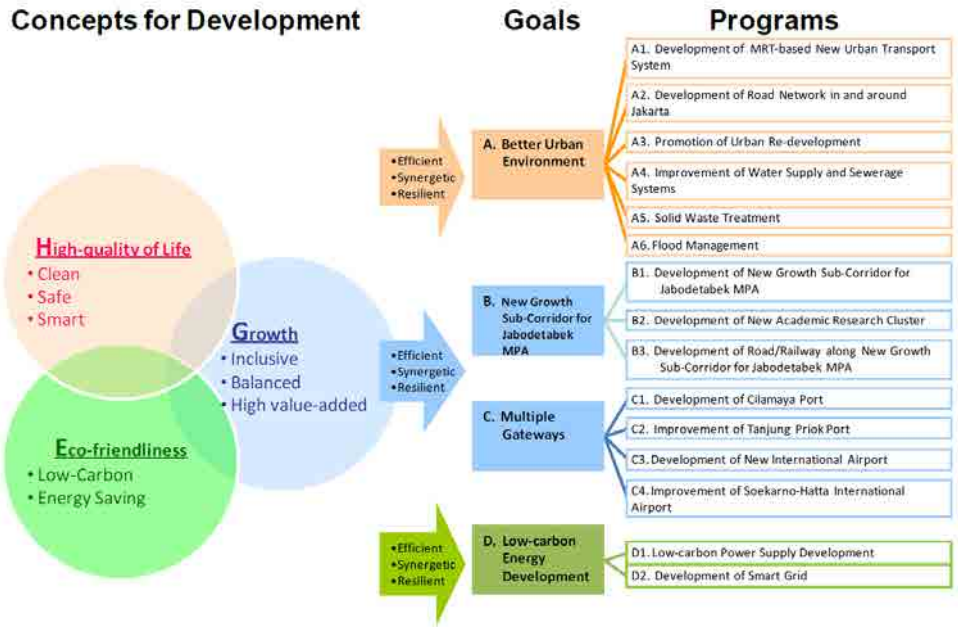


Table 3.32 Priority Projects of MPA

Goals and Programs		Projects
A. BETTER URBAN ENVIRONMENT	A.1 Development of MRT-based New Urban Transport System	(1) Jakarta Mass Rapid Transit (MRT): N-S I, N-S II, E-W
		(2) JABODETABEK Railways Capacity Enhancement Project (Phase I)
		(3) Development of Jakarta Monorail
		(4) Station Plaza Development and Park & Ride System Enhancement
		(5) Introduction of Common Ticketing System (Smart Card)
	A.2 Development of Road Network in and around Jakarta	(1) Improvement of Road Network in JABODETABEK-Enhancement of Road Network Capacity in JABODETABEK
		(2) Development of Jakarta Outer Ring Road
		(3) Introduction of Intelligent Transport System (ITS) in JABODETABEK
	A.3 Promotion of Urban Redevelopment	(1) Pilot Project of Urban Development/ Redevelopment
	A.4 Improvement of Water Supply and Sewerage Systems	(1) DKI Jakarta – Bekasi – Karawang Water Supply (Jatiluhur)
		(2) Rehabilitation of Water Distribution Facilities in DKI Jakarta, Bekasi and Karawang, with the integration of DKI Jakarta – Bekasi – Karawang Water Supply (Jatiluhur)
		(3) Development of Sewerage System in DKI Jakarta
		(4) Development of Water Supply Systems for Large-scale Infrastructure Development
	A.5 Solid Waste Treatment	(1) Construction of the West Java Regional Solid Waste Treatment
		(2) Development of New Landfill Site at Tangerang
	A.6 Flood Management	(1) Reconstruction of East Pump Station at Pluit
		(2) Development of Urban Drainage System in DKI Jakarta
		(3) Normalization of the Rivers in JABODETABEK
B. NEW GROWTH SUB-CORRIDOR FOR JABODETABEK MPA	B.1 Development of New Growth Sub-Corridor for JABODETABEK MPA	(1) Development of New Township
		(2) Development of New Industrial Estate in the Vicinity of the New Airport
	B.2 Development of New Academic Research Cluster	(1) Development of New Academic Research Cluster
	B.3 Development of Road/Railway along New Growth Sub-Corridor for JABODETABEK MPA	(1) Construction of Second Jakarta-Cikampek Toll Road
		(2) Improvement of Road Network in JABODETABEK-Improvement of Road Network within the Industrial Area to the East of Jakarta
		(3) Construction of Access Road to New Cilamaya Seaport
		(4) Construction of Freight Railway to New Cilamaya Seaport
		(5) Construction of Access Road to the New International Airport
		(6) Construction of Jakarta-Bandung High Speed Railway via the New International Airport
C. MULTIPLE GATEWAYS	C.1 Development of Cilamaya Port	(1) Development of a New International Port
		(2) Development of New Car Terminal at Cilamaya Port
		(3) Development of Logistics Park (Supporting Facilities for the New Port)
	C.2 Improvement of Tanjung Priok Port	(1) Improvement and Expansion of Container Terminal at North Kalibaru
		(2) Expansion of Car Terminal at Kalibaru
	C.3 Development of New International Airport	(1) Development of New International Airport
	C.4 Improvement of Soekarno-Hatta International Airport (SHIA)	(1) Construction of Soekarno-Hatta International Airport (Revitalization of Soekarno-Hatta International Airport terminals)
		(2) Construction of Access Railway to Soekarno-Hatta International Airport as FTP
D. LOW-CARBON ENERGY DEVELOPMENT	D.1 Low-Carbon Power Supply Development	(1) Development of Central Java Coal-fired Power Plant
		(2) Construction of Indramayu Coal-fired Power Plant
		(3) Development of Banten Coal-fired Power Plant
		(4) Development of Gas-fired Power Plant and FSRU (Floating Storage Regasification Unit)
		(5) Development of Rajamandala Hydroelectric Power Plant
		(6) Construction of Java-Sumatra Interconnection Transmission Line
		(7) Other Renewable and Low-Carbon Emission Power Projects connecting to Java-Bali-Sumatra Power Network
		(8) Development of West Java Coal-fired Power Plant with Clean Coal Technology
	D.2 Development of Smart Grid	(1) Smart Community (including a pilot project for the Smart Grid)
		(2) Improvement of JABODETABEK Power Supply Quality

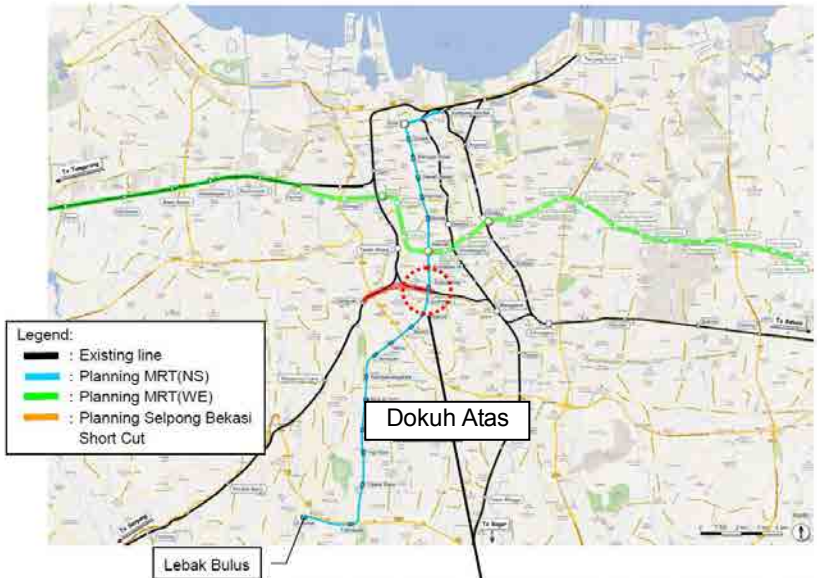
Source: Jabodetabek MPA strategic plan: master plan for establishing metropolitan priority area for investment and industry in Jabodetabek area in the Republic of Indonesia : final report

3.134 In the Mid-term National Development Plan (2010-2014), the development objectives of transport sectors are: i) expansion of traffic infrastructure and capacity, ii) improvement of accessibility to traffic infrastructure, iii) improvement of traffic infrastructure safety, iv) restructuring of institutions of traffic service, and v) measures for climate change (mitigation, adoption). Especially for urban transport sector, necessity of MRT is mentioned to strengthen railway network.

3.135 Around Dukuh Atas Station of Jakarta MRT South-North Line which there are plans to connect to Serpong Line, Ring Line and Airport Line, it is expected to develop a station plaza of artificial ground, underground space and network to surrounding buildings. JICA conducted the "PPP FS Study on Development of Urban Transport and Central District in Greater Jakarta (Model Case of Dukuh Atas Station Area)" to strengthen intermodal function of station and to promote station area development. It is proposed to develop intermodal transfer facilities and urban redevelopment by phase with mechanism to recover project costs.

3.136 At present, JICA has implemented "Preparatory Survey on Lebak Bulus Station Area Development Project" at Lebak Bulus terminal station of MRT South-North Line.

Figure 3.39 Location of MRT South-North Line and Stations



Source: Final Report of PPP FS Study on Development of Urban Transport and Central District in Greater Jakarta (Model Case of Dukuh Atas Station Area)

Figure 3.40 Dukuh Atas Station

Source: JICA Study Team

Figure 3.41 Lebak Bulus Station

Source: JICA Study Team

8) Carbon reduction

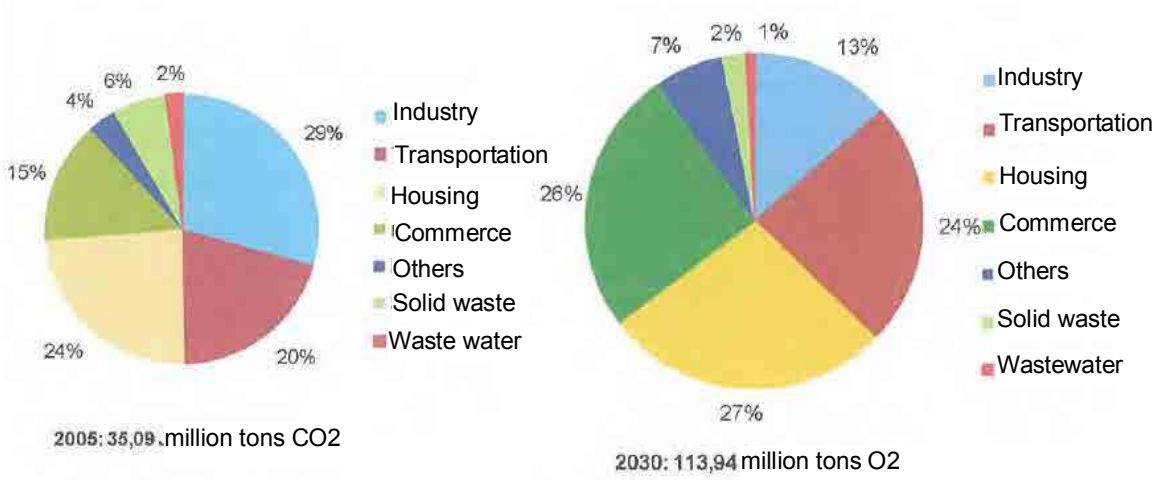
(i) Outline of the carbon reduction efforts

3.137 The President of Indonesia announced the country's emissions reduction targets for GHG at the G20 Pittsburgh Summit (Sep 2009) and COP15 (Dec 2009). The country will reduce the amount of emission by 26% against BAU (business as usual) by 2020, and by 41% with international assistance. The National Action Plan for Reducing Greenhouse Gas Emissions (RAN-GRK) was announced in 2011 based on the above goals and specifies the reduction target as well as action plans for each sector, and, at the same time, requests state governments to also develop their own action plan (RAD-GRK) at the state

level. Meanwhile, the Special Capital Region of Jakarta joined the C40 Cities (Climate Leadership Group) in 2007, announced it will reduce the amount of GHG emission by 30% (based on the emission amount of 2005) by 2030 at the above COP15, and has enacted the RAD-GRK (Decree 131) in 2012, accordingly. According to local hearings, the state's RAD-GRK has been prepared substantially in parallel with the RAN-GRK due to the above background, and it is requested to submit an annual report on progress of reduction efforts to the C40 Committee. The C40 Committee allocates staff to each city, monitors member cities, and distributes progress report to all of its member cities every 1-3 months. From the above, low carbonization is also a matter of high interest to the government of the Special Capital Region of Jakarta.

3.138 Special Capital Region of Jakarta's CO_2 emission amount as of 2005 is 35.09 mil tons, and is expected to reach 113.94 mil tons (BAU) in 2030. Looking at this by sector, the largest emission comes from the industry sector (29%), followed by the housing sector (24%) and transportation sector (20%). In 2030, it is forecast to be in the following order; housing (27%), commerce (26%) and transportation (24%) sector.

Figure 3.42 Special Capital Region of Jakarta's CO_2 emission amount (2005, 2030)



Source: "Kondisi Dan Upaya Pencapaian Target Rencana Aksi Daerah Penurunan Emisi Gas Rumah Kaca" (2013/7/5, Environmental Management Board, DKI Jakarta)

3.139 The target under the state's RAD-GRK is to reduce CO_2 emissions from the expected 113.94 mil tons to 79.76 mil tons (minus 34.18 mil tons) in BAU. The allocation by sector is shown in the below table, and a particularly large reduction is expected of the 4 sectors, namely, transportation (29%), industry (28%), commerce (17%) and housing (15%).

Table 3.33 Allocation of Reduction Amount by Sector

SECTOR	TARGET ACHIEVEMENT PER SECTOR
TRANSPORTATION	**29%**
INDUSTRY	**28%**
COMMERCIAL	**17%**
HOUSEHOLD	**15%**
SOLID WASTE	8%
GREEN OPEN SPACE	**2%**
LIQUID WASTE	1%

Source: "Kondisi Dan Upaya Pencapaian Target Rencana Aksi Daerah Penurunan Emisi Gas Rumah Kaca" (2013/7/5, Environmental Management Board, DKI Jakarta)

3.140 Action plans for reduction are categorized into 3 stages which are those to be implemented by the government of the Special Capital Region of Jakarta (high authority), by the government of the Special Capital Region of Jakarta with assistance from the national government (medium authority), and by initiatives taken by those other than the government of the Special Capital Region of Jakarta (low authority). Action plans for the 4 above highly prioritized sectors are as shown below.

Table 3.34 Action Plans for CO_2 Emission

Sector	High Authority	Medium Authority	Low Authority
Transportation	• Open 10 bus routes (total 171.5km, capacity for introducing BRT 524 buses) • Introduce feeder buses • Build bicycles lanes • Promote energy-saving for public transportation (taxi, motor-tricycle bajaj, microbus) • Traffic management (disperse traffic amount according to time zone, speed control) • Parking lot management • Introduce ITS (traffic management system) • Introduce ERP (Electronic Road Pricing) • Introduce park and ride • Promote eco-friendly bus driving	• Build MRT • Use of CNG gas for public transportation • Measure emission amount of family cars	• Design an incentive system for fuel efficiency • Introduction of double-track railways • Design an incentive system for hybrid cars • Widely spread bio fuel (bioethanol, biodiesel)
Industry	— -	• Utilization of Demand Side Management (DSM) and other technology to promote energy-saving	— -
Commerce	• Promote green building (e.g. city halls, congress halls, schools)	• Promote green building/energy-saving for 3444 state government buildings • Promote green building/energy-saving for buildings other than state government buildings	— -
Housing	— -	• Promote use of energy-saving products	• Replace oil with LPG (liquefied petroleum gas)

Source: Prepared by JICA Study Team based on "Kondisi Dan Upaya Pencapaian Target Rencana Aksi Daerah Penurunan Emisi Gas Rumah Kaca" (2013/7/5, Environmental Management Board, DKI Jakarta)

3.141 The government of the Special Capital Region of Jakarta enacted the "Green Building Code (Decree 38)" in 2012 that was developed with a support of the International Finance Corporation (IFC). Large scaled facilities (residential/office/commercial buildings of over 50,000 sqm, hotel/hospital facilities of more than 20,000sqm, schools of more than 10,000 sqm) which include both the building to be newly constructed and the existing building, have the obligation to comply with the code. In addition to energy-saving for buildings (energy-saving lightings and air conditioners, automated electric equipment), the code also incorporates provisions on waste management and rainwater recycling, and stipulates matters on environmental-friendly building designing. Furthermore, an NGO "Green Building Council Indonesia" cooperates with the government of the Special Capital Region of Jakarta for the promotion of green building, promotes the "GREENSHIP" program which conducts environmental assessment on commercial and office buildings (new and existing) based on its own assessment system, and issues certificates to buildings that comply with the assessment. According to an interview with the NPO, there is no financial/tax incentives for the buildings that have gained high assessment results, but the certification system itself is providing a certain incentive to the building owners as it can be used as a marketing tool (advertising of being an environmentally-friendly developer).

(ii) Issues and needs

3.142 The government of the Special Capital Region of Jakarta is engaged in carbon reduction with enthusiasm, and has already started on many measures specified under the action plan, including "green building." In this study, interviews with the government of the Special Capital Region of Jakarta, local companies, NGOs, and some Japanese companies that are already performing feasibility studies on the smart city business in the state were conducted. This revealed the following issues and areas of improvement regarding the carbon reduction efforts in Jakarta, as well as the expectation towards future inter-city cooperation based on Yokohama City's urban development experiences:

(a) Transportation

- **Green fuel for vehicles:** Popularization of the bio-diesel fuel is also incorporated into the RAD-GRK. Effective method for collecting drain oil needs to be found, but there is possibility of applying this to Jakarta. – a NGO

(b) Industry

- **Stable electricity supply to industrial parks:** Electric outage is occurring frequently, and is negatively impacting the production line. In particular, industries that assume a stable power supply (e.g. precision apparatus) cannot make entry. – a Japanese private company

(c) Commerce (including government buildings and schools)

- **Compliance of existing buildings with the Green Building Code:** Unlike the owners of buildings that are about to be newly constructed, owners of existing buildings usually do not have sufficient funds; therefore, renovation of existing buildings in order to comply with the code is more difficult than constructing a new green building. ESCO business has not yet spread. – a NGO
- **Introduction of new technology leading to green building:** Energy-saving measures for large buildings are an impending issue, and we are interested in

new technology such as BEMS that would improve efficiency in energy use. -the government of the Special Capital Region of Jakarta

(d) Housing

- **Energy-saving at ordinary households:** While the residential sector's energy consumption occupies a large share, legally restricting the consumption by ordinary residents, unlike the consumptions by business entities, is difficult to do. -the government of the Special Capital Region of Jakarta

(e) All Sectors

- **Awareness program and education of citizens:** Citizens have low awareness towards energy-saving and global warming. This is leading to a waste of electricity at homes and excessive use of air conditioners at commercial facilities. Information campaigns and educations are required for raising awareness. Yet, especially for education, even the awareness of teachers is low and cooperation cannot be obtained from schools for providing environmental education. (The government of the Special Capital Region of Jakarta, NGO)
- **Continuous implementation of policies:** Jakarta has already developed specific policies and initiatives to achieve their goals, but it has issues with implementation, which is not limited to the carbon reduction policies. The issue is that governmental policies are initiated yet cannot be fully understood and accepted among its citizens and business owners. -the government of the Special Capital Region of Jakarta, a NGO
- **Project's financing:** Including for carbon reduction projects, we would like to learn the method for effectively raising funds for infrastructure projects. - the government of the Special Capital Region of Jakarta / Although the Indonesian government is highly interested in energy-saving and smart technology, it becomes passive and talks tend to slow down when it comes to specific matters such as financing and land acquisition. –a Japanese company
- **Development of fiscal/financial measures:** Indonesia's Ministry of Finance is reviewing how fiscal/financial measures should be for raising awareness and promoting private business sectors' participation in carbon reduction efforts, and is requesting for advice based on Japanese local governments' experience (in particular, keeping in mind the promotion of the country's Joint Crediting Mechanism). -JICA Indonesia office
- **Development of a land use plan:** Indonesia's Ministry of Public Works is considering how the land use plan relating to measures on global warming should be, and is requesting for advice based on Japanese local governments' experience. -JICA Indonesia office

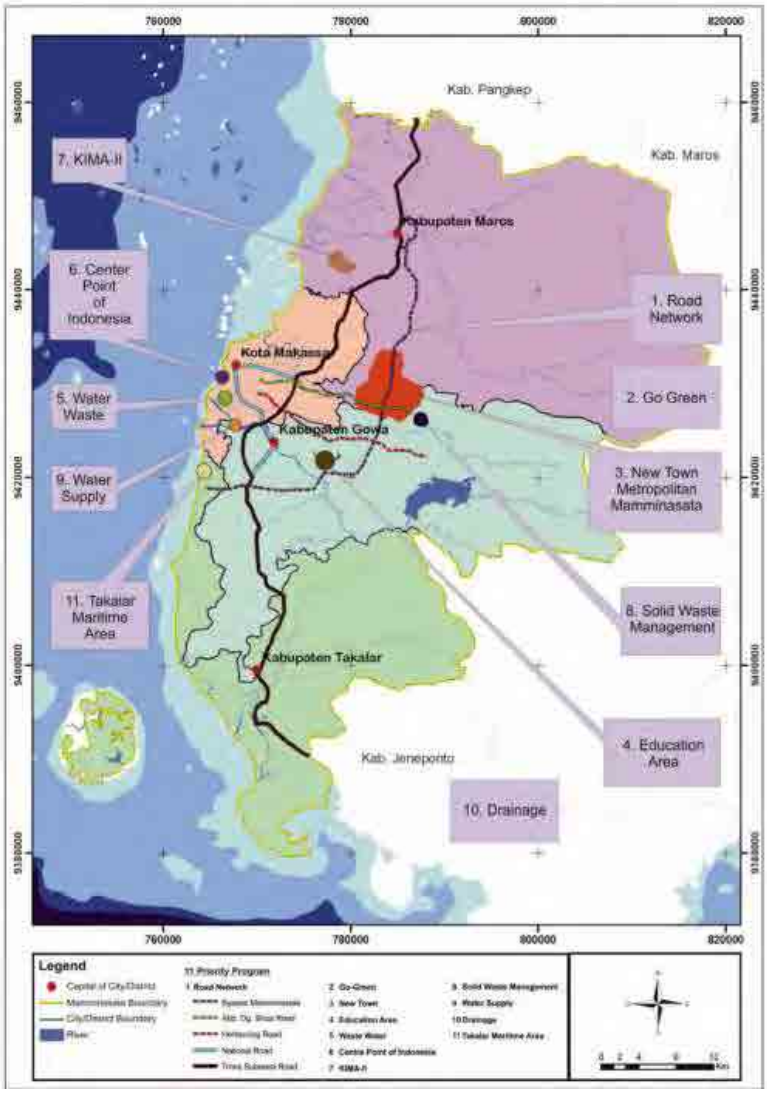
(3) Present Condition and Issues of Makassar City

1) Location

3.143 Makassar is located in the southern part of Sulawesi Island, 175km^2, 0-25m above sea level. It is the capital of South Sulawesi with 1.37 million population. The name was Makassar originally, and renamed to Ujung Pandang in 1971. It was returned to its original name in 1999.

3.144 Maminasata is the metropolitan area of Eastern Indonesia Region with 2,462 km^2, 2 million inhabitants which is located in South Sulawesi Southwest, and Makassar is the central city of Maminasata. Maminasata is composed of Makassar City, a part of Maros Prefecture, a part of Gowa Prefecture and Takar Prefecture. It is designated as special region (social and cultural preservation, economic development, natural resource development and environmental protection), and development of South Sulawesi with a central focus on Maminasata is strategically important in terms of national economic and spatial development.

Figure 3.43 Location of Makassar City in Maminasata



Source: Project Completion Report of JICA Project for Enhancement of Urban Development Management in the MAMMINASATA Metropolitan Area

2) History

3.145 Gowa Kingdom around Makassar City, spread the force as a major maritime nation from 16th to mid-17th century. On the other hand, East India Company in Java was established in 1602 by Netherlands, as a base for trade in spices. The Dutch East India Company was dissolved, and it was declared that the entire Sulawesi belonged to the sovereignty of the Netherlands in 1846.

3.146 It was occupied by Japanese troops in 1942, declared the independence of Indonesia in 1945, Sukarno was elected as the first president. Then, after the War of Independence from the Netherlands over the four years till 1949, the foundation of the Republic of Indonesia was established. Socio-economic development is significantly delayed because of breaking the order, substantial development began in 1966 or later.

3.147 ODA of Japan to South Sulawesi province began from repair project of Gore paper mill factory in 1968, through the assistances to individual production facility such as Bonnet sugar factory, and Pomara nickel refining plant, and Ujung Pandang industrial park of 1977-1979. In urban areas, infrastructure projects such as flood control, water supply, power supply, multipurpose dam for irrigation of agricultural land were conducted. Furthermore, emergency Jeneberang River Basin flood control project was implemented. Associated with the decentralization from 2001, projects for human resource development for local administration and development were commenced. Japanese ODA have contributed to urban development sectors for long-term such as technical cooperation project for the development of the Engineering Faculty of the Hasanudin University from 2006 and the regional solid waste management project for Mamminasata.

3) Socio-Economic Condition

(1) Population

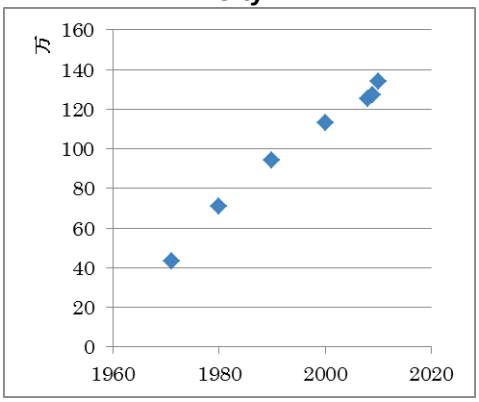
3.148 About 10 million people live in Sulawesi island, and there are 4 provinces with the capitals of Manado, Pal, Kendari, Makassar in north, central, southeast, south respectively. Population distribution is concentrated to the city, especially in Makassar of south and Minahasa of north, while the density of other areas is low.

3.149 Maminasata metropolitan area with 2.3 million population (2,400km^2) accounts for 30% of whole South Sulawesi with 8.3 million population. Among them, there are 1.34mil. population in Makassar City in 175km^2 in 2010, which is 60% of Maminasata metropolitan area. Population concentration of Makassar City has expanded, thereby elicit the city many problems.

3.150 In the population growth of around 18,000 every year, residential area is sprawl to peripheral areas along radial roads. In addition, since high dense residential areas are formed within the city, domestic waste water flows into the gutter and inner city waterway cause the pollution of the river, so poor living environment is also increasing. As a result, the appeal of the urban environment of Maminasata metropolitan area including the Makassar city has been lost. Over-concentration to Makassar city will be continued in the future.

3.151 Concentration of population in the city has caused poverty-stricken areas in the other hand. The slum areas in 2008 spread 7 districts, 323ha, 30 million people, 60,000 households. In 2002, poverty rate of South Sulawesi is a high level still about 16%, 5.6% in Makassar, and 23.7% in Maros Province. Slum clearance projects in Makassar was conducted to construct social housing complex.

Figure 3.44 Population of Makassar City



Source: JICA Study Team

Figure 3.45 Social Housing for Low Income Group for Slum Clearance Project

Source: Presentation material of Makassar City

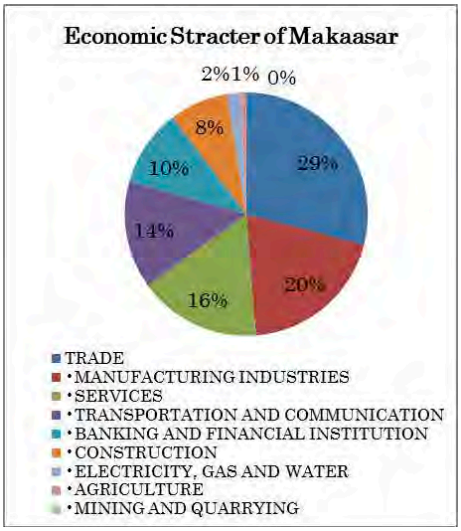
(2) Industry

3.152 GDP share of Maminasata metropolitan area is 36% of the GDP of the entire South Sulawesi, as of 77% is dependent on the Makassar City. Economic growth is 7-8%/year (average of past five years) in South Sulawesi, and Makassar City is 9.5%/year in 2012 respectively, which is higher than that of the 6.2%/year of nationwide.

3.153 Economic structure of Makassar City is composed of trading (29%), production (17%), service (16%), transport (14%), finance (10%), construction (8%), electricity, gas and water (2%) and agriculture (1%).

3.154 The trade and logistics sector, which accounts for 1/3 of Makassar economic activity, added value is low due to lack of information related industries, accounting, and distribution processing. While it is located as a core logistic hub of Eastern Indonesia, logistics system is insufficient is also a reason for the low value-added.

Figure 3.46 マカッサル市の産業構造



Source: Presentation of Makassar City

3.155 Makassar Industrial Park (called KIMA, PT.Kawasan Industri Makassar) is located in the city center, 15km from port area, with distance of 10 minutes from Hasanuddin Airport. It is planned to expand to 703ha in the future from 203ha at present, and to construct a large-scale business center making use of the strategic location. Water tank of 2300m^3, power supply, road transportation network, communication facilities, sewage treatment facilities have been developed in the industrial park. About 150 companies currently are operated in KIMA, which agribusiness industries and distribution related companies are dominant.

3.156 As tourism resources, a majestic seaside sunset, historic sites and buildings such as Fort Rotterdam are popular. There are some attractive facilities such as convention center, Trans Studio Makassar (indoor amusement park), Paotere Harbor, Fort Rotterdam, the Losari Beach and Toraja region. Regional transport network should be expanded to serve for international tourist destinations.

4) Urban Transport

3.157 The radial road network covers Maminasata region connecting to Takalar, Maros, Gowa from the city center and Makassar harbor. In the city center, there are Rajawali Street, Veteran Selatan Street, and A.P.P. Pettarani crossing south-north from Makassar harbor. In addition, a toll road connecting the Hasanuddin Airport and Makassar port is developed, and Makassar industrial park is along this toll road. The road network connecting east-west direction is insufficient compared to the north-south direction. It can be said road network is insufficient for the city with 1.3 million population.

5) Port

(1) Outline

3.133 Makassar Port is a major Indonesian port and one of the 4 most important ports in the nation. Freights being handled are mainly transport by coastal feeder boats and the port is the logistics hub to east Indonesia. 60 voyages /month are made by ferries and it is also the passengers' entrance to east Indonesia. The cargo volume is still not about to exceed the port capacity as it is in Da Nang Port, but expansion of facilities is being planned as in near future, its capacity is still expected to reach to is maximum. The port is operated by PELINDO IV, a state-run port management company, although it outsources a part of the operation to Makassar Terminal Services (MTS) which is the subsidiary of International Container Terminal Services (ICTSI), a port operation company in the Philippines.

Figure 3.47 Area around Makassar Port

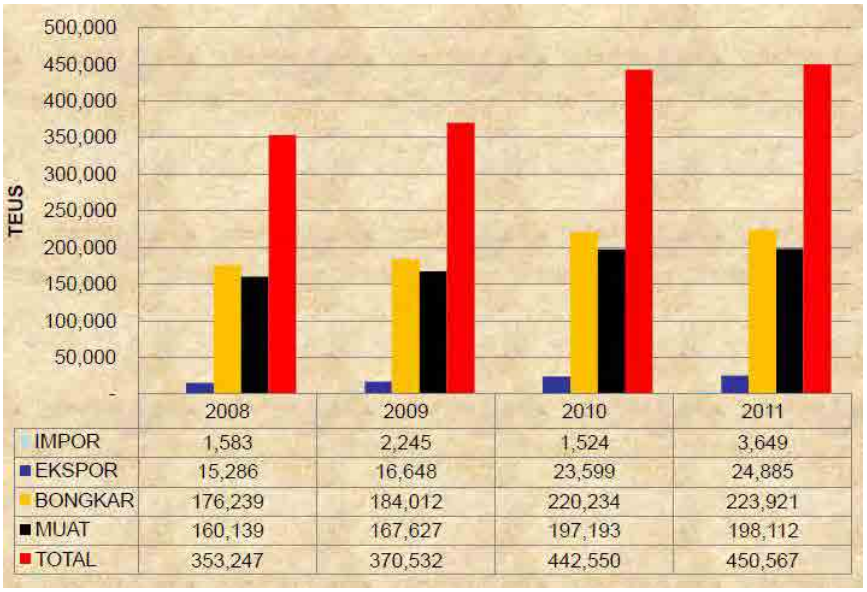
NO	FASILITAS	SAT	VOLUME
1	DERMAGA	M'	2.685
2	GUDANG	M2	23.800
3	LAPANGAN	M2	196.600
4	KAPAL TUNDA	UNIT	4
5	KAPAL PANDU	ORG	3
6	PANDU	UNIT	8
7	CONTAINER CRANE	UNIT	7
8	LUFFING CRANE	UNIT	0
9	TRANSTAINER	UNIT	18
10	REACH STACKER	UNIT	3
11	READ TRUCK + CHASIS	UNIT	22
11	SIDE LOADER	UNIT	1
12	TERMINAL PENUMPANG	M2	3.620
13	KEDALAMAN	M'	12

Source: JICA Study Team edited the "RENCANA PENGEMBANGAN PELABUHAN MAKASSAR, BITUNG, BALIKPAPAN DAN SORONG" (state-run port management company PELINDO IV data, 2012/2) by Study Team

3.134 The port mainly handles passengers, containers, and bulk (fertilizer, cement, cacao, sugar, stone, etc). Out of the annual volume of containers handled during 2012 of 530,000 TEU, 25,000TEU was export/import (increase of 12% y/y), and 600,000TEU is expected for 2014. Although there is still room up to the port's maximum capacity of 700,000TEU, it is expected to reach the maximum in 2016.

3.135 Only a few number of cruise ships come to the port annually, while a large number of passenger ferries arrive as described above.

Figure 3.48 Transition in the volume of containers handled at Makassar Port



	2008	2009	2010	2011
IMPOR	1,583	2,245	1,524	3,649
EKSPOR	15,286	16,648	23,599	24,885
BONGKAR	176,239	184,012	220,234	223,921
MUAT	160,139	167,627	197,193	198,112
TOTAL	353,247	370,532	442,550	450,567

Source: "KESIAPAN TERMINAL PETIKEMAS MAKASSAR MENDUKUNG KEGIATAN ANGKUTAN LANOSUNG PERDAGANGAN INTERNATIONAL" (brochure provided by TPK-MKS)

3.136 Major infrastructure and facilities at Makassar Port are as shown in the below tables:

Table 3.35 Outline of Makassar Port's infrastructure

Yard area	126,400 sqm
Warehouse area	4,000 sqm
Quay	5 (total length 850m)
Maximum berth depth	-17m
Container handling capacity	700,000TEU

Source: "KESIAPAN TERMINAL PETIKEMAS MAKASSAR MENDUKUNG KEGIATAN ANGKUTAN LANOSUNG PERDAGANGAN INTERNATIONAL" (brochure provided by TPK-MKS)

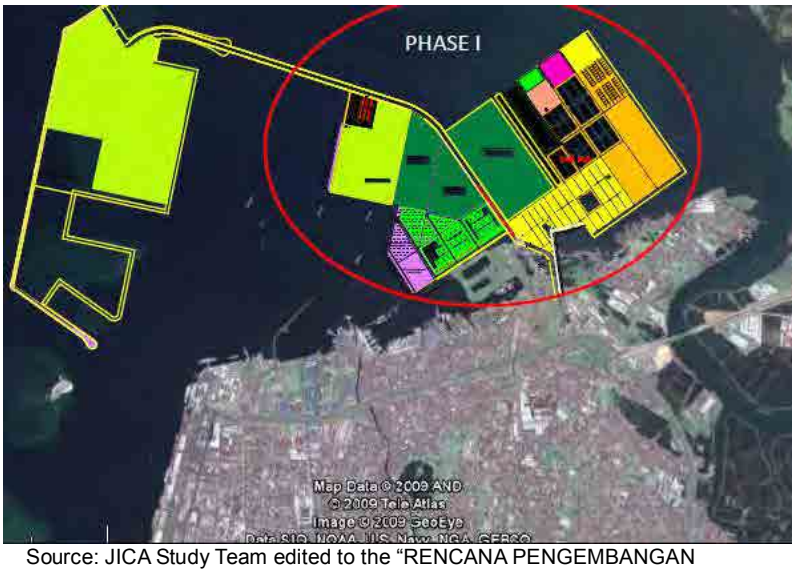
Table 3.36 Outline of Makassar Port's facilities

Gantry crane	7 (5 owned by PELINDO IV, 2 by MTS)
RTG	14
Reach stacker	2
Clamp loader	2
Top loader	1
Side loader	1
Fork lift (7tons)	1
Fork lift battery	5
Trailer truck	20
Chassis	16
Reefer plug	36
CTOS	Used for yard handling

Source: "KESIAPAN TERMINAL PETIKEMAS MAKASSAR MENDUKUNG KEGIATAN ANGKUTAN LANOSUNG PERDAGANGAN INTERNATIONAL" (brochure provided by TPK-MKS)

3.137 As described above, the port's capacity for handling containers is expected to exceed the maximum in 2016, and the expansion of the port function is being reviewed. Specifically, a draft master plan has been developed, assisted by Australia based on JICA study of 2006, and the plan is waiting for MOT approval (as of Jul 2013). Currently, the FS study for the PPP project which consists of Phase 1 (2013-17), Phase 2 (2018-2025) and Phase 3 is being implemented with AUSAID's financial support. Phase 1 is likely to be implemented by PELINDO IV in the traditional way. In Phase1 , 3 container berths of 9-12m water depth will be constructed (each 12.5ha), together with access roads, and the construction cost is expected to be 4 billion rupiah. The bulk port has been relocated to a place 50km from Makassar, and part of the services has begun. Water depth is expected to be 17m at maximum. There is a plan to also relocate the ferry port to another location.

Figure 3.49 Makassar Port Promotion and Development Plan



Source: JICA Study Team edited to the "RENCANA PENGEMBANGAN PELABUHAN MAKASSAR, BITUNG, BALIKPAPAN DAN SORONG" (state-run port management company PELINDO IV data, 2012/2)

(2) Stakeholders of Makassar Port

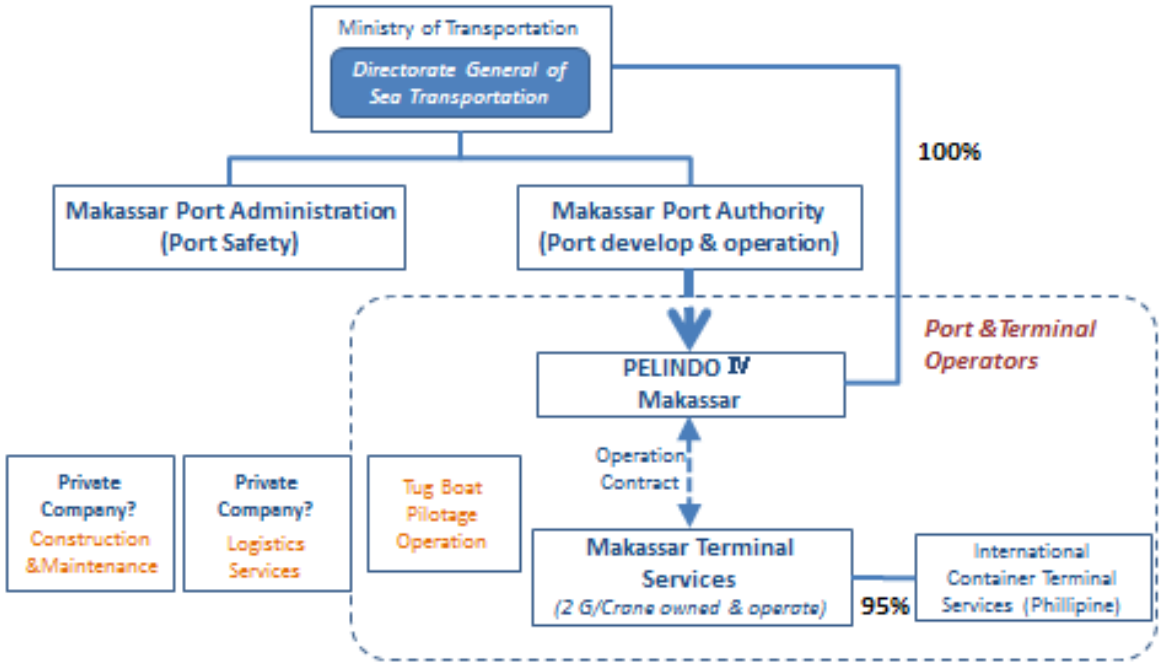
3.138 The port had been comprehensively managed by the state-owned port management company, PELINDO IV, but with the revision to the Shipping Act a port authority was separately established and a part of the authorization transferred. Some of the port operation has been also outsourced by PELINDO IV to MTS, a private company.

Table 3.37 Stakeholders of Makassar Port

Ministry of Transport (MOT)	Directorate General of Sea Transportation which has the authorization to grant approval and license to port development plans.
Makassar Port Administration	The so-called harbor master. Responsible for safety control.
Makassar Port Authority	Makassar's port controller. Established under the Shipping Act 17, 2008. Currently, staffs have insufficient knowledge and experience.
PELINDO IV	A state-run port company which is the comprehensive operator for commercial ports in East Indonesia, including Makassar Port.
Makassar Terminal Services	PELINDO IV outsources a part of the terminal's loading services to the company. Philippine's port operator, ICTS, owns 95% of the shares.

Source: JICA Study Team

Figure 3.50 Chart on parties related to Makassar Port



Source: JICA Study Team

6) Water Supply

(1) Current Situation

3.139 Overviews of water supply are summarized below based on collected information from existing report and interview of PDAM [Perusahaan Daerah Air Minum (Regional Drinking Water Supply Company)] who operate the water supply system in Makassar city.

Table3.38 Outline of Water Supply in Makassar City

Items	Present Status	Note
(1) Start of Operation	Year 1924	
(2) Service Population	1,300,000 persons	Rate of service pervasion 72 %
(3) Water Supply Volume	2,340 L/day (202,000 m^3/day)	Capacity of Existing WTP
(4) Water Resource	Surface water	Jeneberang River (Bili Bili reservoir), Maros River
(5) Rate of NRW	45~51 %	Non Revenue Water including leakage

Source: JICA Study Team

3.140 Drinking water in Makassar city is supplied by Regional Drinking Water Supply Company called as PDAM. Water supply system is covering whole area, 175.9 km^2, of the city. As of 2001, it is consists of 83.7% of water supply system, 16.2% of well/spring system, and 0.1% of others such as river water, rain water.

3.141 Following table shows condition of UFW (Unaccounted for water) of PDAM in Makassar city. As of 2003, accounted water volume is only 32,006 million m3 against production water volume 70,983 million m^3 and UFW ratio indicates very high rate, around 55%. According to interviews of PDAM, rate of NRW including leakage still keep high rate around 45~51% and has not improved at present. Development of water supply system with WTP for future water demand and UFW problem are most serious issues of water supply project in all over the Indonesia including Makassar city.

Table3.39 UFW Condition in Makassar city

Items	Unit	2000	2001	2002	2003	2004
Water Production	Million m^3	38.929	55.356	60.646	70.983	67.388
Accounted water		22.276	29.681	31.011	32.006	N.A.
Difference		16.653	25.675	29.635	38.977	-
UFW Ratio	%	42.78	46.38	48.87	54.91	-

Source: Integrated Spatial Plan for Mamminasata Metropolitan Area (July/2006, JICA)

3.142 Water treatment plants in the city are summarized in following table. Five plants supply treated water of 2,340 little/s totally.

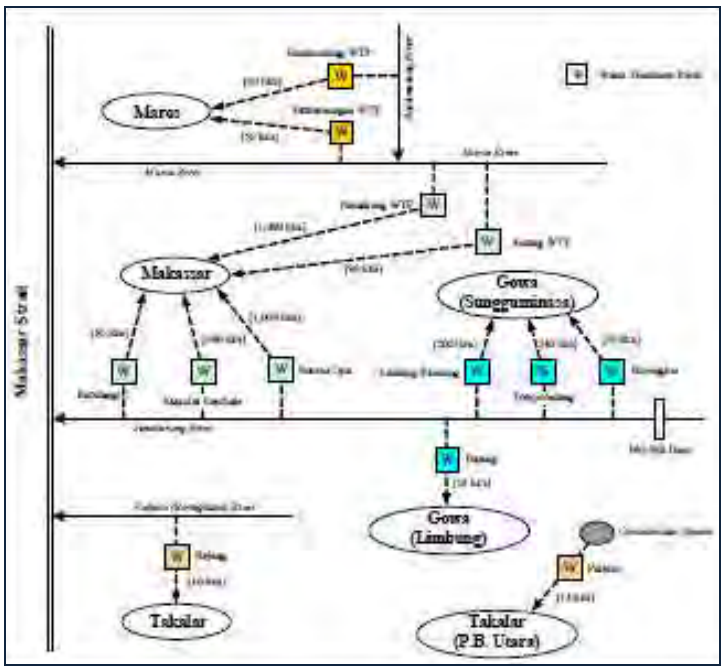
Table3.40 Water Treatment Plant in Makassar city

NO.	Name of WTP	Capacity (little/s)	Water Resource
1	Ratulangi	50	Jeneberang River
2	Panaikang	1,000	Maros River、Jeneberang River
3	Antang	90	Maros River
4	MAccini Sombala	20	Jeneberang River
5	Somba Opu	1,000	Jeneberang River
Total		2,340	

Source: Interview with PDAM based on "Integrated Spatial Plan for Mamminasata Metropolitan Area (July/2006, JICA)"

3.143 Water supply system network in Mamminasata metropolitan area is shown below.

Figure3.51 Water supply system network in Mamminasata metropolitan area



Source: Interview with PDAM based on "Integrated Spatial Plan for Mamminasata Metropolitan Area (July/2006, JICA)"

3.144 Total water production volume in Mamminasata metropolitan area is 2,700 little/s and 85% of that is supplied to Makassar city. Main water resource of water supply system of Mamminasata metropolitan area is Jeneberang River and 55% of total intake volume is taken from there.

(2) Issues

3.145 Based on the field survey and interview to PDAM, issues on water supply project are summarized below.

- **Scope of services by PDAM**: PDAM has established 1924 and has 600 staffs. PDAM manages design, construction and O&M of water supply system.
- **Potential of water resource**: Maros River, one of the main water resources, can provide only 50% of design intake volume in dry season. Jeneberang River has increased its turbidity due to mudslide at upstream area of Bili Bili dam and also has been worried about water contamination by wastewater due to water conveyance through existing settlement by open channels.
- **Improvement of coverage ratio**: Coverage ratio of water supply is about 72% at present. Facility development of water supply system should be expanded immediately for achievement of higher plan target as coverage ratio 80% by 2015.
- **Deterioration of facilities**: Existing distribution pipes, which have constructed since 1924, include asbestos cement pipe of 11km approximately and these deteriorated facilities should be replaced immediately.
- **Reduction of water leakage rate**: NRW ratio including water leakage is very high rate, about 48%. It is caused by mainly leakage from small diameter distribution pipes in which detection of leakage is quite difficult.
- **Promotion of Public-Private Partnership (PPP)**: Existing 3 WTPs out of total 5 WTPs are managed by PPP project. These PPP projects don't include pipe network management. In the future, PPP projects including pipe network system will be required for reduction of water leakage ratio.
- **Complaints from residents**: Main complaint from customer is wrong invoice based on misreading of water meter.

3.146 Water supply system in Makassar city achieves coverage ratio 63% for mainly urban area and related project, such as Water supply project for Mamminasata metropolitan area and PPP projects for expansion of water supply system, have already prepared. As a whole, waterworks in Makassar city is on transitional period from construction stage to O&M stage. Facility development in rural area and effective management of existing system will be required from now. Based on the field survey and interview to PDAM, overview of water supply in Makassar city is shown in following table.

Table3.41 Overview of water supply in Makassar city

Indicator	Benchmark	Overview (Current Condition and Issues)
Facility Development	Sufficient facility development for safety and stable water supply	Coverage ratio of water supply system mainly targeting urban area is 72% at present. On the one hand, coverage ratio of rural areas, in which residential land have been developed, is insufficient.
Operation & Maintenance	>Adequate condition of facility under proper and efficient O&M >Planned O&M for deteriorated facility	NRW ratio is very high as 48% and efficient O&M works, such as distribution control, are not conducted.
Project Management	>Efficient management of project by proper organizational structure >Long term sustainability for financial management	Projects are covered by water tariff at present. On the one hand, financial sustainability of water supply including sewerage project is not secured.

Indicator	Benchmark	Overview (Current Condition and Issues)
Resource / Energy - saving	Contribution for environmentally friendly society by utilization of recyclable resources	Formulation of recycling-oriented society is not promoted at present.
Public Relation	Mutual understanding with residents and private sector by positive public relation activity for sustainable project implementation	There are many complaints for wrong invoice due to misreading of water meter. Positive activity of public relation for residents and private sector is not conducted.
Approaches for Project Implementation	Utilization of ODA and PPP project for effective project implementation	Some projects have been already conducted by JICA, USAID. Implementation of PPP project with private sector is limited.

Source: JICA Study Team

7) Sewerage

(1) Current Situation

3.147 Overviews of sewerage in Makassar city are summarized below based on collected information from existing report and interview of Public Works Office who operate the sewerage system in Makassar city.

Table3.42 Outline of Sewerage in Makassar city

Items	Present Status	Note
[Wastewater]	There is no sewerage system in Makassar city at present	
(1) Start of Operation	-	
(2) Service Population	-	
(3) Treated Wastewater	-	
(4) People with Sanitation	Breakdown of sanitation in the Makassar city for total population of 1.3mil ; Pit Latrine (10%), Septic Tank (90%)	
[Storm Water]	Only small streams called as tertiary drainage, which is equivalent with street gutter, are managed by Makassar city. Primary and secondary drainage, and Rivers are managed by state government.	
(1) Start of Operation	-	
(2) System	Sewage is discharged to existing drainage without treatment.	
(3) Return period	Tertiary Drainage: 2 year Primary/Secondary Drainage: 5~20 year	Rainfall Intensity 60mm/hr

Source: JICA Study Team

(2) Management of night soil treatment

3.148 Many households have sanitation facility such as pit latrine and septic tank. “Integrated Spatial Plan for Mamminasata Metropolitan Area (JICA, 2006)” reported discharge from these facilities cause serious pollution of ground water. According to social assistance index of South Sulawesi state, 84.5% of households in Makassar city have septic tanks. Sludge of septic tanks are collected by PD (Perusahaan Daerah) Kebersihan on request basis. Collected sludge is sent to Antang WWTP which is only plant in Mamminasata located at the east end of Makassar.

(3) Management of wastewater

3.149 Domestic wastewater is discharged to existing drainage without treatment. Water quality in channels and street gutters get worse in especially dry season. Contaminated water stagnates in secondary and tertiary drainage due to clogging of channels caused by sediments and illegal dumping of solid waste.

3.150 Even though BAPEDALDA manages water quality monitoring with establishment of relative regulation/guidelines and carries out education campaign for improvement of residential environment, “Integrated Spatial Plan for Mamminasata Metropolitan Area (JICA, 2006)” reported, water quality in public body is getting worse.

3.151 Management for Industrial wastewater

3.152 Industrial wastewater is also discharged to existing drainage without treatment same as domestic wastewater. Company owners bear the responsibility of industrial wastewater treatment.

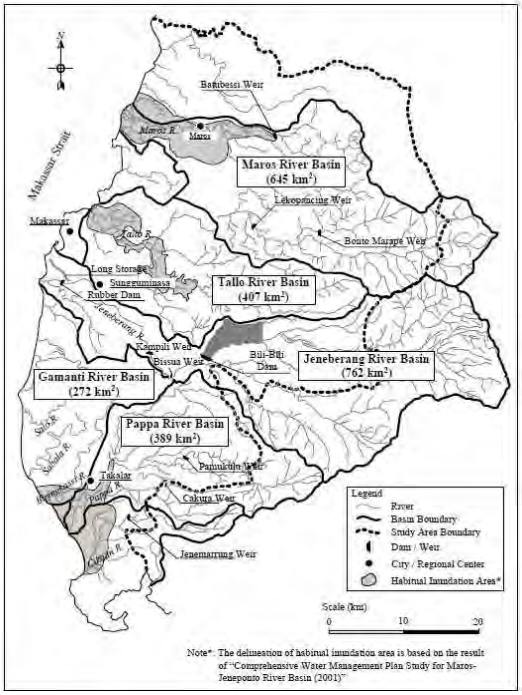
3.153 KIMA industrial park, which is located in northeast of Makassar, has industrial wastewater treatment plant with capacity of 3,000m^3/day.

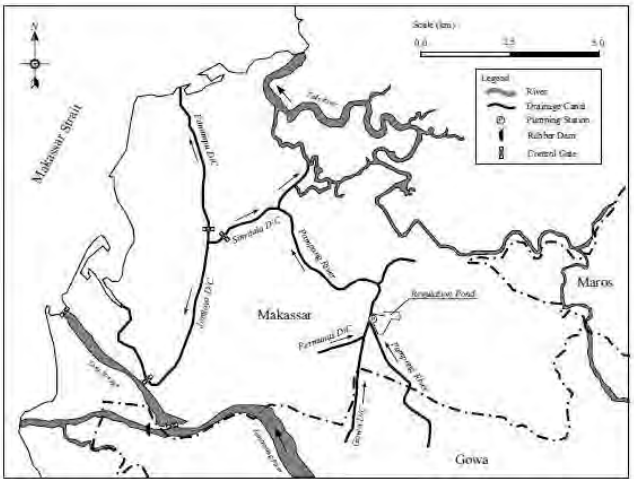
(4) Flood control and Drainage system

3.154 River basin of Mamminasata metropolitan area including Makassar city are shown below. It consists of Jeneberang River with catchments area 762km^2, Maros River with catchments area 6452km^2, Tallo River with catchments area 407km^2, Pappa River with catchments area 762km^2, and Gamanti River with catchments area 272km^2. In Jeneberang River basin, flood control facilities for return period 50 years are constructed in downstream area and Bili Bili multipurpose dam is constructed in upper stream area. Meanwhile, periodical flood has arisen in Maros and Tallo River basin and mid/long term countermeasure for flood problem is required.

3.155 Urban drainage system has developed as shown below. Primary drainage is designed with return period 20 years and secondary/tertiary drainage is designed with return period 2~5 years. However, local inundation problem with 2~3 hour retention has arisen every rainy season with high tide water. Inundation problem is caused by clogging of existing drainage facility caused by inadequate O&M such as accumulated sediments, and illegal dumping of solid waste.

Figure3.52 Drainage system in Makassar





Source: Public Works in Makassar City

(5) Issues

3.156 Based on the field survey and interview to Public Works Office, issues on sewerage project are summarized below.

- **Early development of Sewerage system**: Makassar city has no sewerage system at present. Sewerage system should be developed immediately from viewpoint of improvement for sanitation and water environment in public water body. On one hand, ADB is conducting "Project of Communal Septic Tank System" at some areas but the projects face hard going due to land arrangement for treatment plant.
- **Final disposal of septic tank sludge**: Makassar city has only 7 vacuum truck cars for septic tank sludge collection. It is not enough for demand of collection and causes inadequate O&M of septic tanks.
- **Capacity shortage of existing facilities**: Tertiary drainage managed by Makassar city has developed without coordination of primary/secondary drainage network. It is one of the reasons for capacity shortage of drainage system.
- **Inadequate O&M for existing drainage facilities**: Deterioration, breakage and damages of facility, illegal dumping of solid waste depresses capacity of existing facility and causes inundation problem in urban area. Moreover, water quality in drainage channels is contaminated by wastewater. Lack of budget is one of the reasons for these inadequate O&M.

3.157 Makassar city has only localized small system of sewerage and has no sewerage system for urban area. Furthermore, capacity of existing drainage is not enough for inundation problem in urban areas. As a whole, sewerage in Makassar city is now on construction stage. Sewerage development project in Priority Program for Mamminasata metropolitan area has already prepared. Full scale development of sewerage system is expected from now.

3.158 Based on the field survey and interview to Public Works Office, overview of sewerage in Makassar city is shown in following table.

Table3.43 Overview of sewerage in Makassar city

Indicator	Benchmark	Overview (Current Condition and Issues)
Facility Development	Sufficient facility development for desirable sanitation and water environment in public water body	There is no urban sewerage system in the city and it causes water pollution in public water body. In addition, inundation problem arise in urban area due to insufficient capacity of drainage facility.
Operation & Maintenance	Adequate condition of facility under proper and efficient O&M Planned O&M for deteriorated facility	Inadequate maintenance, such as insufficient cleaning and repair, for existing drainage facilities causes inundation problems.
Project Management	Efficient management of project by proper organizational structure Long term sustainability for financial management	Financial sustainability of water supply including sewerage project is not secured. Lack of budget is one of the reasons for inadequate O&M.
Resource / Energy - saving	Contribution for environmentally friendly society by utilization of recyclable resources	Formulation of recycling-oriented society is not promoted at present.
Public Relation	Mutual understanding with residents and private sector by positive public	Even though educational campaign for residents has conducted, it doesn't bring

Indicator	Benchmark	Overview (Current Condition and Issues)
	relation activity for sustainable project implementation	results.
Approaches for Project Implementation	Utilization of ODA and PPP project for effective project implementation	Some projects have been already conducted by JICA, ADB. On the other, PPP project with private sector has not conducted yet.

Source: JICA Study Team

8) Current State on Environmental & Solid Waste Management in Makassar

(1) Laws and Regulation

3.159 The laws and regulations in national level are already mentioned in the previous chapter for those for Jakarta. The ordinance of the south Sulawesi including Makassar city regarding environmental and solid waste management is shown as below.

- Ordinance No.4 on solid waste management in Makassar city (No.4/2011)
- Ordinance No.3 on organization structure of Makassar city (No.3/2009)
- Ordinance No.38 on official power of the staffs of park and cleansing agency in Makassar city (No.38/2009)

(2) Current Condition on Environmental Management in Makassar

3.160 The environmental management in the Maminasata area including Makassar city is carried out by each environmental management agency (BPLHD: Badan Pengelola Lingkungan Hidup Daera) of South Sulawesi state, Makassar city and other regencies. BPLHD was established in 2009 and its role is to formulate an environmental management plan, examination of environmental impact assessment (AMDAL) reports and conduct environmental monitoring of air and water quality. BPLHD of South Sulawesi state has jurisdiction over 24 districts in the state and control the environmental management with the manpower of operation 60 staffs. According to the authority of the BPLHD, the environmental issues such as solid waste treatment, flood damage, traffic congestion and water pollution have become outstanding issues recently. Illegal dumping or littering at drainage ditches, rivers and canals still remains in the city due to the insufficient collection service and it brings another environmental issue of urban sanitation and cityscape (refer to the photographs below).

3.161 The water quality monitoring is regularly conducted at the rivers of Jeneberang and Tallo within the area, and the monitoring results in 2012 shows that the concentration of E. Coli and COD exceeded the environmental standards (Governor decree No.69/2010) and that the river water has become polluted. The air quality monitoring for ambient air is conducted by the state agency (BPLHD), and the monitoring of the emission of the stationery or mobile source is conducted by city and regencies.

(3) Current Condition on Solid Waste Management in Makassar

3.162 The solid waste management is carried out by the cleansing agency (Dinas Kebersihan) of Makassar city and the regencies of Maros, Gowa and Takalar. The cleansing agency of Makassar city has 700 staffs and its role is to formulate an annual plan on SWM for collection, transport and final disposal of its municipal waste.

3.163 The waste amount transporting to each final disposal facility and the collection cover ratio to its waste generation amount of Makassar city and other regencies are shown in Table below. The collection cover ratio of Makassar city is about 60 % which accounts for

the lower ratio below that of DKI Jakarta (over 85%). The generation amount of solid waste in Makassar is approximately 597 ton/day and its 60 % is transported to the existing Tamangapa landfill and the remaining waste is illegally dumped or treated by them at its generation source. The waste collected at collection area is transported to its final disposal site.

Table 3.44 Waste Amount transported to Existing Final Landfill and Collection Service Coverage

No.	Area	Hauled Waste Amount at Final Disposal Site (t/day)	Collection Coverage (%)	Estimated Waste Generation Amount(t/day)
1	Makassar City	358	60	597
2	Maros Regency	16	52	31
3	Gowa Regency	19	30	63
4	Takalar Regency	3	19	16
Total		396		707
Percentage (%)			56	100

Source：SAPROF Study Report （JBIC、2008）

3.164 The discharge or collection of the household waste is basically classified as below;

- House-to-house collection method (the cleansing agency of the city and regencies collect the waste from the containers al at each household)
- Collection of household waste at TPS (Temporary Storage Area)

3.165 In the case of collection at TPS at community level, the residents at remote area from TPS request their waste collection to the becak (cycle rickshaw) driver for a price. The collection fee depends on the city, regencies and the scale of waste discharge and the types.

3.166 In case of house-to-house collection, on one hand, the residents discharge their waste to the concrete blocks or drums (Refer to the photographs below). However, their awareness toward sanitation or cityscape has not been raised because they can easily discharge their waste at any time and not at regular collection time. The scattering of waste is found surrounding at the containers including the waste thrown into drain ditches in case that not enough collection frequency is secured (Refer to the photographs already listed above).

Figure 3.53 Photos of Waste Littering and Discharge in Makassar

Garbage Littering at Drain Ditch

Garbage Littering on Sea Surface near Rosali Beach

Waste Discharge at Drums

Waste Discharge at Concrete Block

Source: JICA Study Team

(4) Final Landfill

3.167 Tamangapa final landfill currently receives the municipal solid waste of Makassar city. The landfill has 14.3 ha land area and has been operated since 1993. Regular soil covering is not carried out with its exposed wastes at the surface of the landfill and plenty of waste pickers are picking the wastes for recycling (approximately above 100 persons by visual contact) at the dumping sites which may bring safe issues. A facility (Waste-to-Energy) of Methane gas recovery with power generation from the recovered methane gas currently generates 120 kW electricity which is utilized inside the facility.

Figure 3.54 Tamangapa Final Disposal facility

Tamangapa Final Landfill

Methane Gas Recovery and Power

Source: JICA Study Team

3.168 A project for construction of a new final disposal facility at Pattalanssang which is located at about 50 km distance from the city center of Makassar is currently being prepared as a Japanese Yen loan project. The scope of the project was decided in the SAPROF study by the previous JBIC in 2207 to 2008.

Table 3.45 Project Outline of Construction of New Final Landfill

No.	Component	Facilities or Equipment	Finance Source
1	Construction of new final landfill	Area: 42ha (21ha at Stage 1, 21 ha at Stage 2) Impermeable liner for leachate water	JICA Loan
2	Procurement of heavy machines at final landfill	Bulldozer: 2 units Truck excavator: 1 unit Others	JICA Loan
3	Procurement of transport vehicle	Transport vehicle between transfer station and final landfill: 14 units	Indonesian government
4	Construction of transfer station / adjoining facilities at final landfill	1) Transfer station: Existing Tamanggapa landfill site 2) Adjoining facilities Sorting facility (1,500 ton/day) Compost facility (50 ton/day) Leachate water treatment facility (1,800 m^3/day)	Indonesian government
5	Construction of compensation facilities at final landfill site	N/A	South Sulawesi state / Gowa regency
6	Construction of access road	Implementation by Bina Marga	South Sulawesi state

Source: JICA Study Team based on Soild Waste Management Project for Maminasata Metropolitan Area

(5) Recycling Activity

3.169 The recycling in Makassar city is carried out by informal waste pickers at city areas and the existing Tamangapa final landfill and the recovered materials are transported to the landfill.

3.170 Plastics, steel, aluminum, papers and cardboard box are major recyclable materials and they are transported to the dealers in Maminasata area and Surabaya city. Biodegradable waste, on one hand, is processed to compost at community level by NGOs/CBOs and the compost facility, as shown in the project where the home compost at community level was carried out using Takakura Home Method developed in Kitakyushu in Japan and also in another project which was constructed in 1999 by the finance of AusAID and is currently operated by a private company (PT Organic Recovery Group).

(6) Financial Status

3.171 The current financial status of each cleansing municipality agency is shown in Table below. The budget as of 2009 is about 20.9 billion Rupiah.

Table 3.46 Annual Budget of Cleansing Agency in Mamminasata Area

Unit in Billion Rupiah

City / Regency	2007	2008	2009
Makassar	14.97	15.91	20.9
Maros	-	3.1	2.3
Gowa	2.5	2.2	0.8
Takalar	N/A	N/A	N/A

Source: Cleansing Agency in Makassar City

(7) Japanese Assistance in Environment and Solid Waste Management

3.172 JICA has supported to implement projects such as “Study on Implementation of Integrated Spatial Plan for the Mamminasata Metropolitan Area, South Sulawesi Province, Indonesia” in 2006, “Special Assistance for Project Formulation for Solid Waste Management Improvement Project in Mamminasata Metropolitan Area, Republic of Indonesia” in 2008, and “Technical Cooperation Project for Enhancement of Urban Development Management in the Mamminasata Metropolitan Area in South Sulawesi Province” from 2009 to 2012.

3.173 In the "Study on Implementation of Integrated Spatial Plan for the Mamminasata Metropolitan Area, South Sulawesi Province, Indonesia", draft urban plan of Maminasata was formulated, and construction of regional final disposal site in Gowa was selected as a priority project and F/S was conducted. In 2008, SAPROF was conducted.

(8) Challenges in Environment and Solid Waste Management Sector

3.174 The challenges in environment and solid waste management in Makassar city are shown as below;

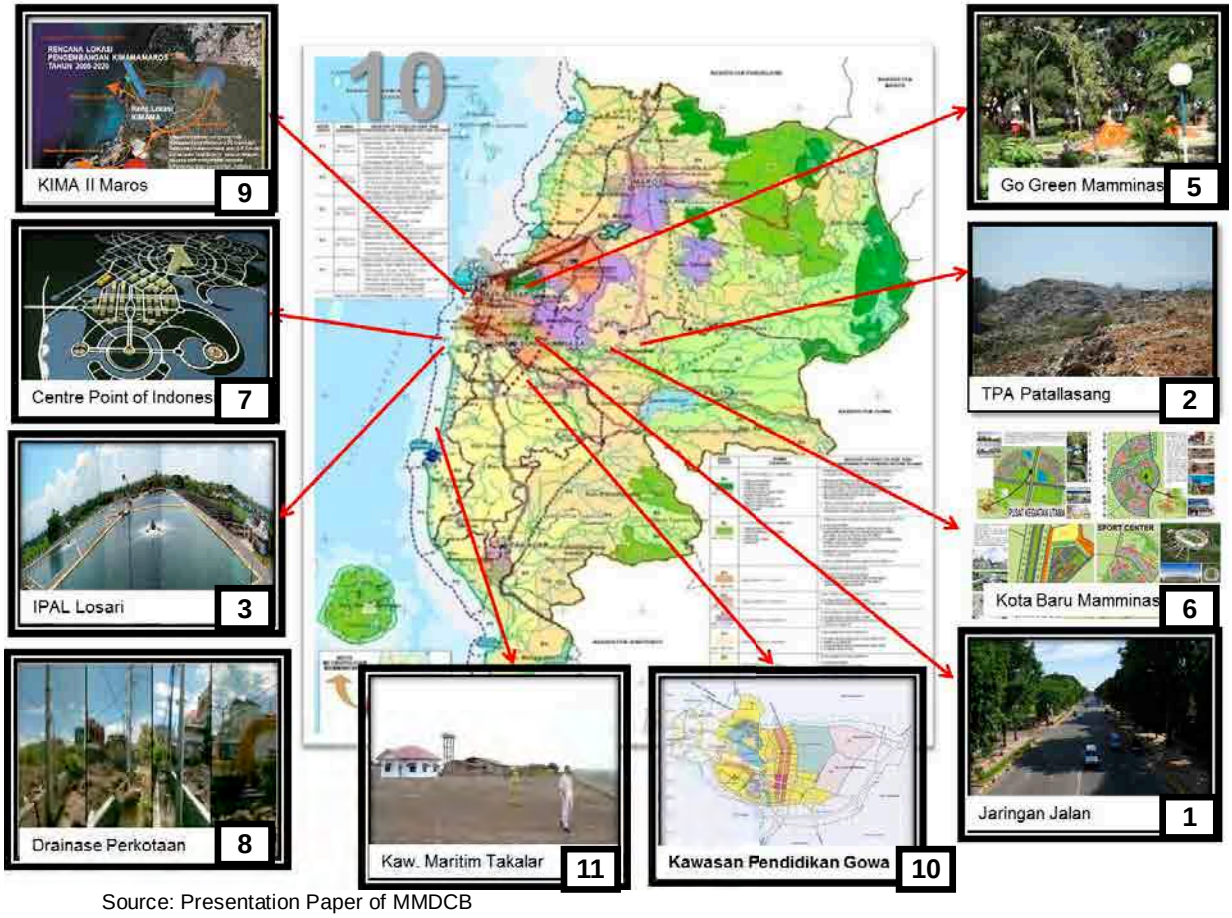
- Quantity of equipment or human resources to be required for environmental monitoring especially for automatic measuring system is not sufficient due to the lack of allocated budget same as Jakarta case.
- Accordingly, the enforcement of environmental monitoring is not carried out actually for the legal or institutional requirement.
- A new sanitary landfill in wide-area waste disposal system is estimated to be developed. An agreement of the stakeholders of Makassar city and other relevant regencies toward the fair management of tipping fee will be necessary
- Illegal dumping of garbage is found in rivers or drainage canals and this will mean that the collection service of municipal solid waste does not reach into every urban area, and the improvement through the collaboration with other sector such as urban development plan, urban drainage and road development will be one of potential options for solution of these issues.
- The existing equipment such as collection / transport vehicles is extremely deteriorated and require for the renewal.
- A space for development of the facilities of recyclable resources materials recovery and compost production is secured inside the planned sanitary landfill site, the PPP (Public-Private-Partnership) project is expected to be implemented.

9) Urban Planning and Urban Development

3.158 Spatial Plan of Maminasata Metropolitan Area was formulated in 2004 and Spatial Plan of Makassar City 2005-2015 was formulated.

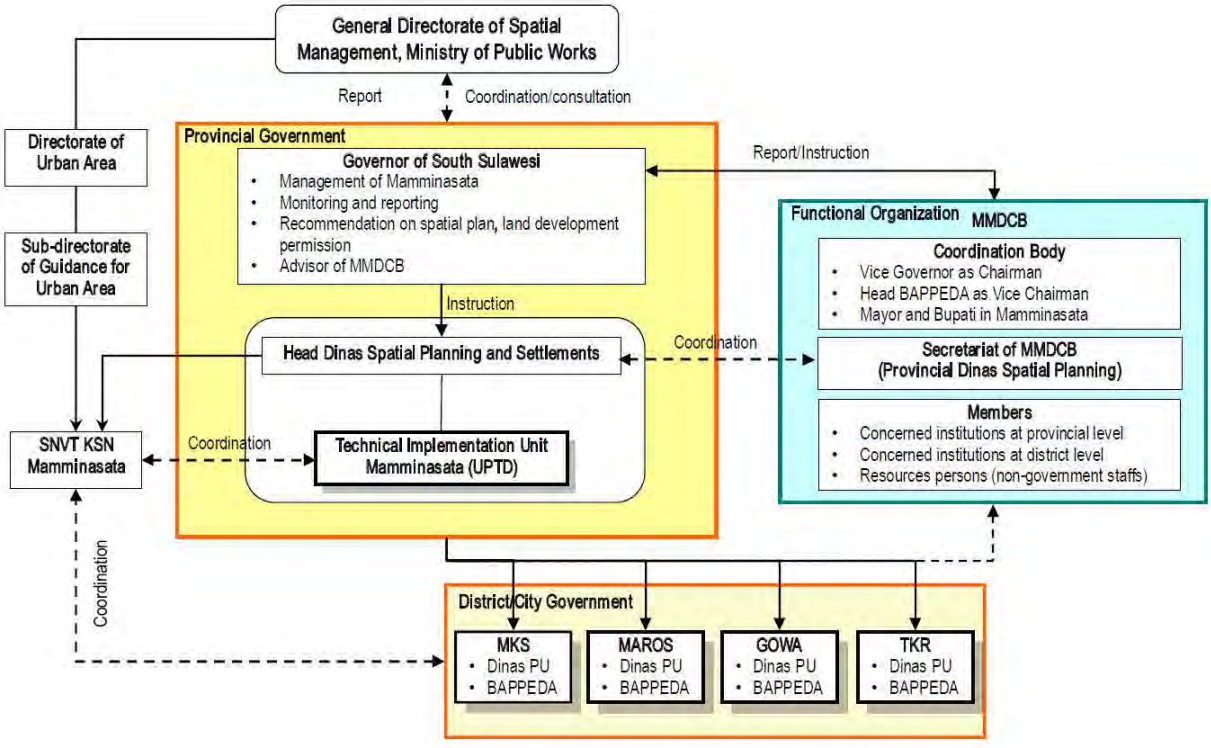
3.159 11 major projects are proposed and has been implemented in Maminasata Metropolitan Area: (1) development of regional trunk road, (2) construction of final disposal site in Gowa, (3) construction of Losari Beach water purification facility, (4) construction of sewerage facility, (5) Go Green Program, (6) development of Maminasata New Town, (7) landfill and CBD development (Center Point), (8) construction of drainage facility in Kota, (9) development of Industrial Zone in Maros, (10) development of environmental zone and (11) port development in Takar.

Figure 3.55 11 Major Project in Maminasata Metropolitan Area



Source: Presentation Paper of MMDCB

Figure 3.56 Organizational Chart of Maminasata Metropolitan Area



Source: Project Completion Report of JICA Project for Enhancement of Urban Development Management in the MAMMINASATA Metropolitan Area

(4) Common Issues of Target Cities

1) Urbanization Process and Impacts

3.160 All the studied cities are in their rapid urbanization process though their scale and speed differ. Urbanization of mega cities like Jakarta started in full-scale in 1980's and has been ongoing ever since. Urbanization, proceeding in large cities, has been spreading to local major cities like Makassar, basically because of nation-wide pressure of urban population growth. It is certain that this urbanization trend should continue for the long term, considering that urban population accounts for 41.8% of the national total population. Vietnam, which had closed itself for long time, has experienced rapid urbanization since it adopted an open-market policy later than other Asian countries and globalization of its socio-economy started. Since current urbanization ratio in Vietnam is still low at 26.4%, urbanization process will move from large cities to local cities steadily.

3.161 Typical urbanization in developing countries in Asia does not accompany sound economic growth and industrialization, ensued by various urban issues such as occurrence of urban slums, expansion of settlement encroaching into areas prone to disaster like flood, overpopulation, poverty, traffic congestion, poor living condition, epidemic of plague, crimes, deteriorated public safety, etc.

3.162 Immigration into the cities as well as higher dependence on automobiles for better mobility contributes to over crowdedness in urban central area and sprawling in suburbs, which further expands urban space, imposing more burden on infrastructure development. Economic growth in Asia got into full swing in late 2000's. Vietnam and India's economy have grown remarkably, reaching a new stage of urbanization accompanied by economic growth. Such economic growth has been driven by FDI, which has put up a new factor for urbanization, that is, inter-city competition in the region to attract FDI.

3.163 Though urban issues in Vietnam and Indonesia have become more serious, urbanization has obviously given a good impact on sustainable development in these countries. New industries are located, improving productivity and creating employment. Robust economic activities increase tax revenue and enable to invest for social infrastructure. People's access to social services is to be improved. Urbanization, leading to capacity enhancement, has diffused to rural areas and given various good effects by improving access to information and services. A city is an apparatus which enables people and socioeconomic to perform activities effectively and efficiently.

3.164 In case of achieving the same level of performance in such activities, a city imposes less environmental burden providing more infrastructure compared to a non-city area

3.165 It is well known that there is positive correlation between urbanization and economic growth. Urbanization cannot be avoided, needless to wait for such research findings. The present time is the era when a nation's economy depends on the performance of cities. Cities are the origin of competitiveness for nation's economy and a locus to agglomerate information and to create new values. Human resources development and advanced services cannot be provided without cities. Cities serve as fortress against disasters and also an apparatus to alleviate adverse impact on the global environment. With cities, nation's natural environment can be managed in a more proper manner.

2) Approach

3.166 Newly emerging cities, along with economic development, are confronting a variety

of urban issues such as immigration, sprawling caused by over crowdedness in built-up area, traffic congestion, living condition deteriorated by pollution and short of infrastructure, economic disparity and poverty, and growing damage by disasters. They lack technology, finance, institution, and capacity to address such complex urban issues and to control growth of cities. On the other hand, urbanization still continues, and is thought even to be accelerated. In such circumstance, s, cities play roles as an engine of national's growth, supplier of advanced services, hub of information, knowledge, and cultural exchange, and gateway to the world, which roles are recognized to become stronger. At the same time, it is assumed that competition among cities is becoming fiercer, not only at worldwide or Asian regional level but among cities at national level. Many emerging cities are not prepared to handle such a rapid urbanization. They have come under pressure to address new issues like globalization, aging society, global warming, etc., while being forced to manage to provide basic needs such as infrastructure.

3.167 Although urban problems which newly emerging cities growing rapidly are suffering from differ according to cities' development history and socio-economic characteristics, Japanese cities including Yokohama had experienced the above-mentioned urban problems in the past. Solving the urban problems requires a comprehensive approach to secure economic, social, and environmental sustainability, and to aim at proper city management. In order to secure sustainable development in the target cities, it requires handling the following four aspects in an integrated manner on a time-frame.

(a) Enhancement of growth management and economic competitiveness: It requires cities to provide enough employment opportunities as well as strengthen economic competitiveness at international and regional levels to vehicle nation's economy. For this purpose, it requires enhancement of the international and regional connection by expansion of networks of land, sea, and air transportation and information, development of competitive central business districts (CBD) creating employment opportunities, improvement of investment environment such as infrastructure, institutional system, and human resources, and advanced quality service industries such as tourism, medicines and education. In this process, a fundamental issue of urban development is how to control and guide developing path in spatial socio-economic aspects, and how to precede urban development taking account of relationship among different level of spaces such as national, regional, metropolitan area, and inter-city .levels, and different sectors such as urban development, transportation, infrastructure services, environment, etc.

(b) Improvement of living environment: Citizens living there are the leading players of the city. Cities must provide good environment for their lives and activities for all the various kinds of people living there. In particular, in large cities, since various urban problems suffer more low-income people and low income community areas, due attention must be paid to them. Living environment is evaluated with measurements such as convenience, safety, health, and amenity. Emerging cities still lack basic infrastructure, and capacity of operation and maintenance. New towns and apartments are constructed while housings affordable for low and middle income classes are short of supply and urban amenity is insufficient. It is required to improve basic urban infrastructure, increase supply of affordable houses both in supply and institutional systems, and develop parks and green space, and so forth.

(c) **Security of environmental sustainability**: Large cities, in their developing process,

or as a result of development bring about a variety of environmental conflicts. Urbanized area encroaches into agricultural land, occasionally expands destroying the valuable ecological system. Expansion of urbanized area without adequate infrastructure development causes problems such as flood, water pollution, ground subsidence, incurs disorderly land use, and worsens disaster management and urban health. Population concentration in cities aggravates traffic congestion and accelerates air pollution. Environmental sustainability must be secured while the city's socio-economy is developed. Development of cities should go along with economy and environment being balanced; the city's attractiveness should be enhanced by conserving the ecological system and cultural heritage; the pollution should be alleviated; and living conditions should be made for citizens to enjoy their life comfortably. While global environment problems have become more serious, the emerging cities, which are vulnerable to natural disasters such as flood, land slide, earthquake, and tsunami, needs more strengthening of disaster prevention capacity and countermeasures against climate change. In addition, it is an important environmental issue to conserve and enhance cities' traditional value and culture which cities have accumulated during their long history of development.

(d) **Urban management:** It is imperative to control urban growth in a proper manner for economically, socially and environmentally sustainable development. Strengthening of planning capacity to identify problems aptly, establishment of participatory mechanism to coordinate various interests smoothly, development of mechanism to facilitate project implementation, expansion of fund raising methods, institutional reform to enhance infrastructure for urban development administration, and human resource development are all required to be facilitated. To this end, it is necessary to establish institutional system suitable for urban development and financing, improve organizational efficiency and capacity, beef up stable financial base of local governments, collaborate with neighboring local governments and the national government, enhance citizens' participation, and make use of the private sector, and so on.

3) Problems and issues cities of developing countries are confront

3.168 Cities are required to handle imminent urban issues, while, as mentioned above, they are aiming at economically, socially, and environmentally balanced, sustainable urban development. Japanese local government including Yokohama City, have found solutions to the problems and accumulated the know-hows, making efforts to improve environment and services for the citizens' everyday life while they share their long-term development vision and strategies with their citizens and private firms. In solving the urban problem, it is essential to understand the common issues of each sector, and to implement concrete projects and actions based on them. The table below summarizes the sectoral problems and common issues that cities in developing countries are confronting.

Table 3.47 Sectoral Problems and Common Issues of Cities in Developing Countries

Sector	Problems	Common Issues
Urban Development	• Sprawl of urbanized area, disorderly development • Disorderly construction of high-rise buildings • Deterioration of land scape • Lack of housing for low-income families • Disaster risk • Lack of capacity to formulate, implement, and manage urban plan and urban development (human resources, institutions, finance, etc.)	• Strategic infrastructure development • Development of competitive industries • Improvement of convenience and safety of citizens' daily life • Improvement of urban attractiveness by making use of local resources (nature, culture, history, human resource) • Environmental conservation
Urban transport	• Lack of traffic management • Traffic accidents • Lack of public transportation services • Lack of transportation infrastructure (facilities, maintenance) • Air pollution	• Formation of urban spine by developing transportation infrastructure • Traffic safety • Provision of public transportation services • Development of transportation infrastructure to reduce environment load • Maintenance of transportation infrastructure
Water supply & Sewerage & drainage	• Low service coverage ratio in suburbs • Damage of flood and inundation • High rate of water leakage • Decrepit facility and equipment • Water contamination (salt damage) • Industrial wastewater control • Lack of operation and maintenance capacity	• Facilitation of development of water supply and sewage and improvement of service coverage ratio • Development of drainage and flood control • Water quality improvement • Strengthening of capacity of operation and maintenance • Improvement of management and operation
Environmental Management & Solid waste management	• Air pollution, Water contamination, soil contamination • Environment destruction • Influence by climate change (sea level rise, salt damage, etc.) • General waste treatment system (collection, treatment, disposal) • Awareness raising for environment	• Control of pollution source • Facilitation of environment monitoring • Countermeasure to climate change • Development of waste treatment facility • Awareness raising of citizens for reduction of waste
Port	• Clarification of roles of ports for cities • Acceptance of large vessels • Incoherent physical distribution service • Lack of operation and management	• Expansion of port functions according to roles • Smoothing of distribution service and customs clearance procedures • Strengthening of capacity of management, operation and maintenance of port (development of port administrator function)

Source: JICA Study Team

4) Fundamental Issues of the Target Cities

a) Da Nang City

3.169 Da Nang City has coped with urbanization process properly because its urbanization speed has been moderate, that it, unlike Hanoi and Ho Chi Minh, is a little away from the international gateway, that the population size of Da Nang was not so large, and that the city's management capacity has been good enough to procure own finance and invested in infrastructure, mainly roads and bridges. The urbanization pressure in Vietnam, however, has started shifting from Hanoi and Ho Chi Minh to other local core cities, and the urbanization pressure on Da Nang City has become larger due to its highly valued investment environment.

3.170 Da Nang city's own finance comes mainly from the revenues of the concessions for land development right with a limited term. As a result, investment has been accelerated on construction of high-rise buildings in the central area, development of resorts, and residential and industrial estate development in the suburbs, which has created a new attraction while leading to sprawling of urbanized area and oversupply with short demand. This situation challenges Da Nang City to address the following issues:

(i) Although urbanization accompanies population increase and expansion of employment opportunities and needs for infrastructure services, it seems that many of the developments in Da Nang City target at the higher income group and FDI, compete in the limited market.

(ii) The current development patterns will not fully contribute to urban spatial structure and accepter which can accommodate a full-scale urbanization—the future population of Da Nang will reach 2.5 million.

(iii) The approved Master Plan of Da Nang shows the future urban spatial structure; it is a little weak in mechanism to control and guide actual developments towards it.

3.171 The above-mentioned urban development patterns are common in many cities in Vietnam. Though the situation in Da Nang City is rather better than in Hanoi and HCMC, as the results of these development patterns, development of infrastructure and affordable housing seems to fall behind for ordinary citizens, the congested living conditions in the central area has not been improved fully, while the sprawl is spreading out to the suburbs with low density and lower service level of infrastructure.

3.172 Thus, a proper control of developments based on the master plan is required as soon as possible. It is essential that Da Nang City, adopting “Environmental City” as its slogan, show concrete, basic strategies towards it, which government, private sectors and citizens can share the vision and objectives. On the contrary, the concept of Environmental City is not clearly defined, public participation mechanism is not property formulated, and the master plan will be limited to only the physical plan that illustrates the spatial structure, which shall be materialized, taking account of social, economic, and environmental significances. Messages including in the master plan are understood from the evaluation of DaCRISS as follows:

(i) **Form the Urban Spatial Spine towards a city with a population of 2 to 3 million**: To guide urbanized are to develop in the direction of north-south including the expansion of Quang Nam Province; to establish public transportation system with mass rapid transit (LRT, BRT) as backbone; to form a compact urbanized area by urban development along and integrated with the mass rapid transit; development of utility network by utilizing the space of roads and transportation network.

(ii) **Facilitate the development of the competitive core areas that accompany a real demand**: Development of a new CBD and revitalization of the CBD integrated with the MRT and transportation trunk roads, development of new towns in the suburbs for low and middle income classes, upgrade the existing industrial estates, improvement of the environment of the resort area, redevelopment of the existing built-up areas, etc.

(iii) **Construct a city resistant to natural disasters**: In principle, enforce the land use zoning thoroughly to eliminate dwelling and activities in the disaster prone areas; take countermeasures according to the degree of hazard risk; delineate lands suitable for development as “environmental zoning” from the environmental viewpoint, that is, conservation and disaster protection.

3.173 The advantages of Da Nang City is that development impacts from surrounding areas are not much, infrastructure development have been met population increase, and coordination among local governments are promoted compared to Hanoi and HCMC. So Da Nang City is in the position to grasp itself comprehensively from social, economic, and environmental aspects, and to implement concrete policies and projects taking account of

their reciprocal actions. And Da Nang city is one of the few cities which have an administrative capacity to carry out them with a certain level of assistance. Needless to say, although Da Nang City has many problems in each sector as well as the fundamental issues, it is likely that daily works in each sector and individual projects can be facilitated by making an effort to realize the future urban spatial spine for the entire city, with the fundamental issues at the forefront.

3.174 A comprehensive and strategic approach is indispensable to encourage a sustainable development in Da Nang City, which has the potential for that. The following points are to be heeded:

(i) **Secure the implementation of the city master plan**: One of the shortcomings of the planning system in Vietnam is that sectoral master plans are made individually and not coherent with each other, such as a city master plan by DOC, a transport master plan by MOT, and an environmental master plan by CONRE. This has been discussed once in an integrated manner under the leadership of the city mayor of Da Nang City in DaCRISS. It is important how much an actual coordination can be done when implementing the master plans in the future.

(ii) **Formulate clear strategies to pull the central economic region:** Coordination of Da Nang City in policies and plans with neighboring Quang Nam Province and with Hue City is insufficient. It is important for Da Nang City to make coordination with Hue City in role sharing in ports and airports and collaboration in tourism, and with Quang Nam Province in the continuity of urbanized areas, collaboration for tourism development, and coastal management. As for industries, the region's industrial potential can be enhanced by coordination for regional strategic locations of industrial estates as the Da Nang-Quang Ngai expressway is being constructed. As for the above-mentioned points, Da Nang City should take the initiative for coordination.

b) DKI Jakarta

3.175 Jakarta is a mega city in the Southeast Asia, equal to Manila, the Philippines, that has not been able to develop infrastructure to catch up with the pace of swelling population and expansion of urbanized area, and been worsening urban problems. Common to the two cities is that many studies had been done repeatedly since the 1970's with many recommendations made; however, not many of them were implemented and they had kept missing the chance to take fundamental measures. Meanwhile, the problems had been worsen, because they lacked resources such as finance, human resources, institutional system, and technology compared with the seriousness of the problems and that ODA had not been utilized sufficiently. Traffic condition in Bangkok which was called the worst in the 1980's has been improved by the construction of mass rapid transits and expressways, it is said that the notorious position now is given to Jakarta and Manila. What makes Jakarta and Manila not optimistic about their future is that the population sizes of the nations of Indonesia and the Philippines are large and these two cities never stop keeping attracting immigrants. Looking at population size, Jakarta and Manila are expected to swell and become mega metropolitan areas with a population of 30 million around the year 2030, next to Tokyo.

3.176 In such a circumstance, Jakarta has set up MPA and started conducting full-scale undertakings and the resulting achievements are expected. The MPA's vision has the following four pillars: creation of affluent urban environment, formation of new seven growth corridors, development of multi-nucleus gateways, and development of low carbon energy, and specified concrete measures to realize the vision. By this, strengthening of

economic competitiveness, improvement of living conditions, and enhancement of environmental sustainability are simultaneously implemented, it is expected to get Jakarta Metropolitan Area on the track of sustainable urbanization process. Therefore, the issue Jakarta must address is to implement the MPA project without delay and at the same time to heed the generation of synergetic effects among the projects by monitoring the project implementation process.

3.177 Jakarta Metropolitan Area which is still swelling cannot be revitalized without strengthening and constructing the fundamental structure of the metropolitan, and at the same time, it should response to the needs for the improvement of sub-centers. As long-term actions and short-term solutions to the problems are often inter-related in the city, it is important to manage the programs to maximize investment effects gained from the both. It is also pivotal to continue long term programs that will not bring effects in a short time, avoiding excessive political interventions.

c) Makassar City

3.178 Makassar City is expected to play a larger role as the hub city in east Indonesia, towards nation-wide balanced development in Indonesia which has a vast national land and a large population. The city's long term vision is "aiming at the city which is environmentally sustainable at the global level and the center of a port, trade, education, services, and culture"; for this, following policies are stipulated: human resource development, spatial structure, environmental development, enhancement of economic structure, anti-corruption and decentralization, and compliance and protection of human rights; and eleven big programs are specified.

3.179 It is reasonable that the vision aims at the hub city of physical distribution, information, services, human resources development, and cultural activities in east Indonesia, by becoming an ecological and attractive city centering on trade and services. Workshops held in Makassar, however, revealed that specific strategies and a roadmap towards the vision did not seem specified yet. The 11 big projects have not designed the contents in detail; and it is not clear that the implementation of the 11 project will contribute to the realization of the vision. Although necessity for both the vision and projects is understandable, they should be checked out whether or not they lead to the desirable city structure under the urbanization pressure which is currently continuing strongly. This means that Makassar City, based on the master plan supported by JICA, should specify strategies, re-design implementable programs and projects again, and clarify the implementation mechanism.

3.180 Based on exchanges of views with the relevant persons and a field survey in a limited time, development issues of Makassar are sorted out as follows:

(i) **Strengthening of gateway function:** To develop Makassar as the hub of east Indonesia, it is required to develop direct flights with major cities of the Asia region. By doing so, Makassar will become more competitive as international tourist destination and the function as international logistics hub will be enhanced.

(ii) **Development of the port area:** To enhance Makassar's degree of being hub (logistics, international trade), enhancement and expansion of the port function is indispensable, and at the same time, the concept of water-front development in Makassar is also necessary to be taken in. Port areas of large cities, usually located in the central area of the city, transforms from nothing but a cargo handling facility to

more value-added, diverse use such as cruising, recreation, commercial, cultural facilities as the city become matured. In case of Makassar, it seems to be the time to consider the port facility moving out of Makassar to the nearby area, in order to alleviate the situation where the port facility hampers waterfront development and large trucks worsen the traffic congestion in the city. This is expected to allow the MAMINASATA region to enjoy economic benefit created by the port, and to facilitate the construction of a new core city of ecology, services, human development, information, and culture which is the Makassar's vision.

(iii) **Development of the City's Spine:** Though Makassar City is required to accommodate the increasing future population properly, provide a quality environment, develop a competitive activity hub, and shape urban spaces for securing smooth traffic, the city's policies do not state them clearly. To this end, the policy on preservation and development should be specified, land should be classified into preservation area and development area by environmental zoning, land use and land development should be controlled, and a hierarchized transportation network should be materialized in a coherent manner.

3.181 All the studied cities face rapid urbanization process though their scale and speed differ. Urbanization of mega cities like Jakarta started in full-scale in 1980's and has been ongoing ever since. Urbanization, proceeding in large cities, has been spreading to local major cities like Makassar, basically because of nation-wide pressure of urban population growth. It is certain that this urbanization trend should continue for the long term, considering that urban population accounts for 41.8% of the national total population. Vietnam, which had closed itself for long time, has experienced rapid urbanization since it adopted an open-market policy later than other Asian countries and globalization of its socio-economy started. Since current urbanization ratio in Vietnam is still low at 26.4%, urbanization process will move from large cities to local cities steadily.

3.182 Typical urbanization in developing countries in Asia does not accompany sound economic growth and industrialization, ensued by various urban issues such as occurrence of urban slums, expansion of settlement encroaching into areas prone to disaster like flood, overpopulation, poverty, traffic congestion, poor living condition, epidemic of plague, crimes, deteriorated public safety, etc.

3.183 Immigration into the cities as well as higher dependence on automobiles for better mobility contributes to over crowdedness in urban central area and sprawling in suburbs, which further expands urban space, imposing more burdens on infrastructure development. Economic growth in Asia got into full swing in late 2000's. Vietnam and India's economy have grown remarkably, reaching a new stage of urbanization accompanied by economic growth. Such economic growth has been driven by FDI, which has put up a new factor for urbanization, that is, inter-city competition in the region to attract FDI.

3.184 Though urban issues in Vietnam and Indonesia have become more serious, urbanization has obviously given a good impact on sustainable development in these countries. New industries are located, improving productivity and creating employment. Robust economic activities increase tax revenue and enable to invest for social infrastructure. People's access to social services is to be improved. Urbanization, leading to capacity enhancement, has diffused to rural areas and given various good effects by improving access to information and services. A city is an apparatus which enables people and socioeconomic to perform activities effectively and efficiently.

(5) Assistance Needs by Sector of Target Cities

1) Urban Development

3.185 Da Nang City and Makassar City are medium-scale cities with 1 million populations, and it is assumed that rapid urban development will be promoted because of economic development and population inflow from rural to urban area. On the contrary, FDI is easily affected by economic trend in the world. Furthermore, cohesive power is weak since the CBD has not been developed unlike mega cities. While there are various attractive resources such as beautiful seaside in two cities, international competitiveness of tourism sector is not strong because of lack of infrastructure and service.

3.186 There are master plans and priority projects, but coordination and integration among landuse, transport and environment, and strategies to formulate urban structure are lacked. In addition, though drawings of priority projects are developed, the implementation mechanism such as project methods, finance, schedule by phase, and public participation mechanism, etc. is not clearly formulated. For this, assistance needs of urban development sector are institutional improvement and capacity development to realize strategic infrastructure development and urban growth management.

3.187 The master plan of Da Nang City was approved recently. It includes similar issues such as CBD development, new town development, public transport development, which lessons learned from Yokohama City can be applied for. Especially needs for technical assistance on sharing experiences and know-how of integration of strategic projects, implementation mechanism of master plan, and roles of local governments for public participation, etc. In case of Da Nang City aiming to the Environmental City, the city is interested in learning know-how of disaster management in short-term and measures for climate change in long-term of Yokohama.

3.188 In case of Makassar City, experiences and know-how to promote each project are insufficient, while various large-scale projects are proposed. Methods to formulate plans and implement CBD development and new town development can be shared from Yokohama to Makassar. Not only infrastructure development, but also traffic management such as parking management, bus operation, traffic management around commercial facilities, improvement of pedestrian space, etc. will be effective in short-term.

Table 3.48 Assistance Needs for Urban Development Sector

Assistance Needs		Contents
Infrastructure development	Integrated development of CBD and urban structure	• CBD development • Public transport network development connecting CBDs • New town development
	Waterfront development	• Gateway development as international tourism, port and environmental city • Capacity development as container terminal
	Housing development	• Housing supply for low and middle income groups • Implementation mechanism for residential area development including land preparation, transport and infrastructure development • Management of and collaboration with private developers
Urban plan management	Control and guidance of urban development	• Landuse management in respond to population increase and urban sprawl and realization of master plan (urban growth boundary, zoning system, etc.) • Coordination with regional plans and management • Urban redevelopment project implementation mechanism of built-up areas

		• Land acquisition methods for infrastructure (property assessment, consensus building, compensation, right conversion, etc.) • Institutional arrangement for Public-Private-Partnership
	District plan	• Public facility, infrastructure and housing development of district units • Area management • Public participation mechanism
	Enhancement of attractiveness	• Redevelopment of seaside (development control, public space development, treatment of drainage and sewerage, etc.) • Improvement of pedestrian space (traffic management, sidewalk development, improvement of streetscape, etc.) • Urban design to meet with local characteristics
Transport development	Road development	• Hierarchical trunk road development • Sidewalk development with barrier-free concept • Maintenance of roads and bridges (Plan – Do – Check – Action cycle)
	Public transport development	• Restructuring of bus routes and improvement of bus services • Development of BRT and MRT • Introduction of environmental-conscious vehicles
	Traffic management	• Traffic management of mini buses and private vehicles • Parking management • Introduction of ITS
Industrial development	Economic development	• New industry promotion and facility development (IT, MICE, eco-business, medical and health care service) • Incentive for investment to new industries • Employment promotion and human resource development (managers, engineers)
	Tourism development	• Tourism network development connecting existing resources (seaside, world heritage, gastronomy, etc.) • Human resource development of tourism sector (language, management, service)
	Model of environmental city	• Pilot projects for energy-saving, climate change, smart city in model area • Certification and incentive for new technologies

Source: JICA Study Team

2) Water and Sewerage

3.189 According to results of field survey, it is confirmed that facility development of water supply precedes sewerage as tendency in the city of developing countries.

3.190 Water supply has mainly developed in urban area and the development in rural area has delayed. In urban area, many existing facilities have aged and some problems for project management such as water leakage are arisen. It is also one of the issues to develop integrated water resources for facility expansion in future.

3.191 Sewerage development has completely delayed and it causes 1) deterioration of sanitation in urban area by domestic wastewater, 2) water environment damage by industrial wastewater and domestic wastewater in new developing areas. Low priority of sewerage project in other infrastructure projects has delayed sewerage development and early development of sewerage is expected.

3.192 As regards urban drainage, flood/inundation problems have frequently arisen in all target cities of this study and there are many needs for urban drainage facility development. On the other hand, developments of drainage facility have delayed due to insufficient cooperation with central government who manages large scale rivers. For the future, comprehensive flood control project will be required by cooperation with central government, related agencies, private sector, and citizens.

3.193 As a common issue for water supply, sewerage and drainage, capacity building for staff in related agency is confirmed. It includes not only capability of facility O&M for future

sewerage projects but also capability of project management for water supply. Additionally, assistance needs for recyclable energy use is also confirmed and it is considered to increase in future reflecting society needs.

Table3.49 Assistance Needs for Water supply and Sewerage Sector

Assistance Needs		Contents
Infrastructure building	Facility development and expansion for water supply and sewerage	• Elimination for gap of facility development between urban area and rural area • Development of stable and safety water resources • Utilization of On-site (small-scale) system • Improvement of safety level of flood control by installation of run-off control facilities
	Rebuilding of deteriorated facilities	• Effective operation of existing facility (incl. reduction of water leakage) • Planned reconstruction of aged facilities
	Promotion of recycling system	• Development of reclamation facility • Development of sludge recycling facility
Project Management and System building	Formulation of business plan	• Setting of water & sewerage tariff structure for sound financial management with profitability
	Control of Industrial wastewater	• Development of treatment facility for factories and large-scale housing land development • Establishment of monitoring system
	Promotion of PPP project	• Development of legal system for PPP project • Promotion of active entry by private sector for PPP project (Development of project scheme for private sector utilization) • Strengthening of public relation activity for citizen's participation
	Capacity building for staff of related agency	• Capacity building for Facility O&M • Capacity building for project operation and financial management

Source: JICA Study Team

3) Environmental and Solid Waste Management

3.194 For environmental management, pollution measures, monitoring, capacity building and human resource development are commonly required. In addition, initiatives such as measures for global warming and climate change, and environmental education in a medium to long term is also required.

3.195 In case of Da Nang city, Da Nang city declared as the Environmental City in 2008, so formulation of action plans and financing to implement projects are desired.

Table 3.50 Assistance Needs for Environmental Management

Assistance Needs		Contents
Infrastructure Development	Measures for Pollution	• Check of environmental management report required to specific enterprises • Confirmation of the compliance status of effluent & exhaust emission standards and improvement & strengthening of monitoring and guidance activities.
	Development of Monitoring System for Environmental Air Quality & Water Quality	• Installation of regular monitoring stations of environmental air quality and water quality, improvement and strengthening for the activities of measurement, analysis, reporting, etc.
Planning, Institutional System, Human Resources, Organizational	Environmental Education	• Introduction of environmental education system for the stakeholders including government, citizen and enterprises in the pilot study area and expansion to the whole city. • Environment monitoring at the citizen level, the

System, etc.		establishment of environmental leaders system
	Measures for Global Warming	• Promotion of efficient use of energy for residential houses & enterprises and introduction of subsidy system
	Environmental Development for Bio-diversity	• Introduction of biological research in collaboration with educational institutions • Conservation and creation of inhabiting space for creatures and promotion of urban development for the citizen enjoy greenery and water

Source: JICA Study Team

3.196 Solid waste management is a serious issue which will worsen in accordance with population increase and economic growth. In addition to assistance needs for new infrastructure such as construction of intermediate treatment and disposal facilities, and rehabilitation and expansion of existing facilities, overall solid waste treatment system improvement including improvement of garbage collection system, procurement of garbage collection vehicles, etc. Target cities are interested in 3R activities which private sectors and citizens participate in, and individual techniques of removal of water, etc. which private sectors can provide services and facilities.

3.197 In case of Makassar City, it is required to formulate regional final disposal site development and management plan which relevant authorities of provincial level coordinate.

Table 3.51 Assistance Needs for Solid Waste Management Sector

Assistance Needs		Contents
Infrastructure Development	Implementation of Regular Collection in Suburbs (New Urban Area)	• Expansion of regular waste collection & transportation area corresponding to the expansion of city area due to urbanization • Waste collection & transportation in the whole urbanized city area
	Development of Sorting and Recovery Systems of Resource Materials	• Implementation of sorting and recovery of resource materials at the waste generation source of residential houses and enterprises in the pilot area • Establishment of good practices and development to the whole city area
	Installation of Resource Recovery Facilities	• Secondary sorting of recovered resource materials and installation of materials recovery centers in the city area with the functions of information center and exchange center of resource materials for the purpose of increasing the recovery ratio
	Development of Intermediate Treatment Facilities	• Development of intermediate facilities from renewable energy potential of waste (waste to energy plant, bio gasification and/or compost plant of organic waste) • Waste disposal volume reduction, detoxification and stabilization of disposal waste through appropriate operation, maintenance and management of the plants
	Development of Final Disposal Facilities	• Expansion/Development of landfill facilities to prepare for the timing of the end of life of landfill of the existing disposal site (estimated around 2020) • Securing new disposal facilities through the regional disposal plan
	Improvement of Landfill Work	• Review of currently practiced landfill work for the purpose of management of the existing disposal facilities as a sanitary landfill • Appropriate operation, maintenance and management by improvement
	Improvement of Landfill	• Improvement work of the existing leachate treatment

	Leachate Treatment Facilities	facilities to meet with the effluent standards at all times • Appropriation of operation, maintenance and management
	Improvement and Expansion of Hazardous Waste Incineration Facilities	• Improvement of medical waste and hazardous waste incineration facilities • Appropriate treatment through expansion of the hazardous waste treatment facilities
	Improvement and Expansion of Septic Tank Sludge Treatment & Dewatering Facilities	• Improvement of the existing septic tank treatment facilities or development of new facilities for performing appropriate operation, maintenance and management
Planning, Institutional System, Human Resources, Organizational System, etc.	Forming of Resource Recycling Society	• Establishment of integrated legal system and the relevant law system • System development and implementation of collaborative activities among the sectors of administration, enterprises and citizen through formulation of the policies and planning
	Formulation of Integrated Solid Waste Management Plan	• Formulation of integrated solid waste management plan based on the 3R activities and selection and implementation of the priority projects including the development of intermediate treatment facilities
	Construction of Public-Private Linkage for 3R Activities	• Implementation of 3R activities at the pilot study area (s) through collaboration of the sectors of administration, enterprises and citizen • Dissemination of good practices in other areas
	Financial Strengthening of Solid Waste Management	• Introduction of waste management account • Collection of appropriate level waste fee • Introduction of new income source business • Increase business efficiency and cost-cutting
	Organizational Strengthening and Human Resource Development	• Implementation of appropriate solid waste management plan through organizational reform, securing human resource and training

Source: JICA Study Team

4) Ports and logistics Sector

3.198 It was revealed through the results of local survey on the cities of Da Nang and Makassar that, in terms of trends in the port sector of cities in developing countries, expansion of port facilities were needed for responding to the increase in the volume of containers handled and the scale of vessels becoming larger. Simultaneously, we observed that regarding the operation of ports, cargo owners' needs were not necessarily being satisfied due to the lack of efficiency and quality in cargo handling and the lack of knowhow on facility maintenance. It was identified that particularly on the cargo owners' side, there was a need towards improving port management and operation knowhow. Management of the port entrance and leaving by vessels is inefficient, as seen in such case of the berth meeting (the meeting among shipping companies that determines the order of vessels' entrance into/leaving the port) currently taking about 1 hour on a daily basis, and there were requests towards more efficient procedure. Introduction of IT/computerization was understood as an option which may improve the efficiency in the management of vessels' entrance into/ leaving port and also could enable a port to provide better services, such as online tracing of shipped containers as well as a speedy customs clearance procedure. Therefore, it can be said that there is a large need for supports in the area of financing and project formulation for realizing these facility developments/improvements, and for technical assistance on port management and operational procedures.

3.199 There was also strong demand for the capacity building of the port authority function for improved efficiency and transparency in port management. There are currently no port authorities in Vietnam, but there is a program plan in which multiple model ports will be selected for a pilot introduction of the port authority function, under the support by JICA and OCDI. In case Da Nang Port were to be selected, it is possible that human development assistance for such newly established port authority organization be required. Makassar has already established its port authority which does not seem to be fully functioning due to the lack of human resource and expertise, so assistance in capacity building is being sought.

3.200 As for the Da Nang Port, there was a strong request from the local government for strengthening the logistics network between the port and the inland area due to its geographical significance of being located at the starting point of the East-West Economic Corridor. There were also requests for entry by companies that are able to provide extensive and comprehensive logistics services for the East–West Economic Corridor, in addition to the need for construction of logistic facilities such as inland depots and logistics centers.

Table 3.52 Assistance Needs for Ports and Logistics Sector

Assistance needs		Description
Infrastructure building	Drafting of a development plan for the port and surrounding area	• Drafting of a development plan for the entire port area, which is well-corresponding with the future demand projection
	Terminal expansion	• Facility expansion for responding to increased cargo and larger scaled vessels
Port management and operation	Capacity building of the port authority function	• Capacity building of the human resources on management knowhow as a port authority
	Improvements to the management of port entrance and leaving/ customs clearance management	• Establishment of an efficient management structure and procedures, as well as effective information management (container tracing) • Computerization of customs clearance procedure
	Improvements to container terminal operation	• Technical assistance regarding efficient operation methods for cargo handling services, etc
Strengthening of logistics	Construction and operation of logistics facilities	• Development of supporting facilities such as inland depots and logistics centers • Operation knowhow for the above facilities
	Market entry by logistics companies	• Participation by logistics companies that provide extensive logistics services

Source: JICA Study Team

5) Carbon Reductions

3.201 From the current situation of the Special Capital Region of Jakarta on which the local study was conducted, it was confirmed that the local government was highly interested in carbon reduction measures, and had developed specific goals and action plans. On the other hand, it seems that the government had issues on how to implement the measures and have these fully followed by the citizens and private sectors, and it has a high interest in how awareness campaigns and education activities for citizens should be, and in the knowhow for having citizens and operators involved and cooperate in the effort.

3.202 Also from technical aspects, the government of the Special Capital Region of Jakarta shows an interest towards energy-saving technology that leads to green building, and also towards the latest technology such as BEMS utilized in Japan's smart city verification projects. Meanwhile, among Japanese companies that are already conducting a feasibility

study locally on smart community business, there are concerns over matters such as "when talks touch upon financing and land expropriation in particular, discussions with the local government does not go as hoped" and "demand for energy-saving at the operators and citizen's level is small (particularly as electricity charges are low) and whether the project can work out is unclear." Electricity charges are gradually going up, and moves can be seen to rectify the excessive grants provided to electricity services.

3.203 As there are discussions going on between the Japanese and Indonesian governments for cooperation based on the bilateral credit system (JCM), the establishment of incentives and assistance measures that are required for promoting carbon reduction projects in future are also being reviewed at the central governmental level.

3.204 For building the system at the national level as stated above, JICA's Indonesia office made a suggestion on the possibility of contribution by Japanese municipalities that have promoted urban development by using national measures and budget, in the form of advice based on their own experience.

Table 3.53 Assistance Needs for Carbon Reduction Sector in DKI Jakarta

Assistance Needs		Description
Technology introduction	Green fuel for vehicles	• Development of project for widely spreading biodiesel fuel and knowhow on the collection and utilization of drain oils
	Stable supply of electricity to industrial parks	• Introduction of technology such as storage batteries and FEMS that were experimented under the smart city verification project to local industrial parks
	Compliance by existing buildings to the Green Building Code	• Widely spreading of the ESCO project that enables renovation of existing buildings for energy-saving with limited cash on hand
	Introduction of new technology leading to green building	• Introduction of technology such as BEMS, implemented at smart city verification projects to promote green buildings
	Energy-saving at ordinary households	• Project for the sales and wide spreading of energy-saving home appliances
Establishment of regulation systems (provincial level)	Energy-saving at ordinary households	• Regulations/policies aimed at citizens energy consumption behaviors such as subsidy system coupled with awareness raising activities as well as restrictions and/or incentive measures
	Continued implementation of governmental policies	• Knowhow on enforcing governmental policies to general public level, as well as promoting participation by citizens and operators in the effort
	Awareness campaigns/educations of citizens	• Implementation knowhow for awareness raising for citizens • Education curriculum for schools, method for instructing school teachers/having teachers become aware
	Financing of projects	• Knowhow on financing projects
Establishment of regulation systems (national government level)	Development of fiscal/ financial measures	• Establishment of support measures for promoting technical transfer as well as PPP projects through JCM
	Development of a land use plan	• Support on development of an extensive land use plan for responding to climate changes

Source: JICA Study Team

4 Potential Collaboration with International Cooperation and Business by the Japanese Municipality in Developing Countries

(1) Proposed Collaboration Approach

1) Approach for international cooperation and business development

4.1 The City of Yokohama has cooperated with organizations such as JICA in the past, and been involved in technical cooperation for individual infrastructure projects in developing countries and acceptance of overseas trainees. In recent years, however, many cities in developing nations are undergoing rapid urbanization, accompanied by numerous urban issues and challenges in realizing a sustainable growth, including appropriate prioritization of various infrastructure development projects, establishment of a comprehensive urban plan that ensures connectivity between each project, and enforcement of adequate regulations and guidance measures to facilitate the steady implementation of the urban development plan. In addition, cities in developing countries lack experience in constructing infrastructure, the level of their operation is low, and they are seeking advice from past similar experience for the realization of projects and for improving their operation method, and are also in need of support in developing the capabilities of local officials. A comprehensive urban plan is not a mere collection of individual projects in each sector, but can be achieved only when there is an agreed vision, prioritization with a panoramic view of all sectors, gradual and phase-by-phase development approach based on the long-term planning, strategic projects to realize such approach, and the mechanism for enforcing their implementation. Realization of these approaches would require the municipal government that manages the city to act as the facilitator and also to involve various stakeholders, such as the central government, private sector and citizens. Cities in Japan including Yokohama City have a strong track record in the management of the issues associated with rapid urbanization. In other words, knowhow and expertise for a “comprehensive urban development” rests with city governments. When considering the ways of future international cooperation by these Japanese cities, it would be meaningful also for developing nations if their experiences and expertise in comprehensive development planning as well as urban management methods were shared and transferred, rather than participation only in individual technical cooperation programs.

4.2 As described in Chapter 2, the City of Yokohama has launched the Y-PORT project and been promoting international cooperation in such fields as comprehensive urban planning and infrastructure technologies. Their major activities include the execution of memorandum with cities in developing countries that have an interest for establishing a relationship with Yokohama and sharing information, while arranging local visits, holding seminars and workshops and promoting networking for promoting the City’s companies’ overseas business expansion. Furthermore, it cooperates with international agencies such as JICA and the World Bank for accessing developing countries’ various needs and business opportunities, in addition to executing memorandum with the private companies with a large amount of experience in overseas infrastructure projects. Among the SMEs in the City also, a variety of information is actively shared through business conferences and other platforms aimed at future business expansion in developing countries. There are some SMEs which have already succeeded in overseas business, too. There is also a case in which a public corporation that succeeded the city government’s infrastructure

management expertise, such as Yokohama Water Co., Ltd. is proactively engaged in business F/S in developing nations.

4.3 Such activities has promoted information sharing between Yokohama and the partner cities in emerging nations on local needs and business opportunities, and also has improved the understanding and the expectations towards Yokohama's track record and expertise among the partner cities. Yokohama's Y-PORT Project activities have been widely publicized to companies in the City that are now actively considering overseas business expansion by conducting local site visits and obtaining local information through Y-PORT initiative. It is fair to say that now in Yokohama, there is a good foundation for connection and cooperation has been formed among various stakeholders such as the City government, international agencies and the private sector interested in overseas technical cooperation as well as business expansion. Yokohama, therefore, is now in the stage to start some actual projects and substantial cooperation and business development in these partner cities, making the full use of the already established formation among the stakeholders for facilitating necessary collaborations.

4.4 Considering the above circumstances, specific intercity cooperation method that is expected of Yokohama can be categorized into (1) support in the development of policies and plans, (2) business project realization support, and (3) support in the establishment of regulative systems and capacity building. The City may provide comprehensive support in these areas. Support will not remain in city employees providing traditional technical support and cooperation in infrastructure construction programs, but Yokohama should take an approach in which public and private citizens will cooperate, by calling to the private sector and, furthermore, to citizens for participation. It is important that Yokohama provide support, assess and share the method for realization from the viewpoint of a city government from the planning (or review) stage. In building infrastructure or introducing new technology, the City will call to companies located in Yokohama to participate in construction projects. As for the establishment of regulative systems, including facilitation of citizen participation and designing / implementation of regulation/guidance measures, an area in which Yokohama City especially is highly experienced at, a long-term support including the continuance of training programs in addition to seminars and workshops, OJT training sessions by inviting overseas trainees to Yokohama (1 year or more) and/or dispatching of specialists who are incumbent or retired city employees, to the partner cities, is required. Facilitation of technology exchange and citizens' communications at the grass-roots level would also be indispensable, which will include the promotion of joint studies conducted by city-to-city education research institutions or NGO activities.

4.5 Specific assistance assumed are as described below:

4.6 **Support in the development of policies and plans:** Support in the development of the city's To-Be vision and future development scenario, and in the development of implementation policies and plans based on such vision and scenario. This will involve the review of existing master plan or the development of a roadmap, selection of development projects to be prioritized when considering the overall urban plan and selection of intangible projects such as the establishment of regulative systems and/or human resource development, and provision of support and advice in the establishment of an organization or structure for leading /coordinating urban development activities. City governments generally need to establish their own development master plan and/or project plans for each sector. There is a high possibility that Yokohama could share their experience of

urban development, which was flexible and comprehensive, facilitating coordination well among different sectors, to support these planning process. It also has a high experience in "phased development approach" which is important in dealing with rapid urbanization, as well as urban planning which emphasized inter-sector coordination facilitated by the City's Planning and Coordination Bureau.

4.7 For the above basic/overall policy on urban development, the City of Yokohama may act as an advisor or apart of the planning members through the "Urban Development Task Force" described later in this document. Specifically, specialists in the area of urban plan and regulative system building with practical experience in local government's policy and plan development, such as Yokohama City's employees or former employees, may be dispatched as major members of the task force, and cooperate, if adequate, with JICA consultants who are experts in urban planning. At the same time, as Yokohama may gain an understanding on the possibility of infrastructure construction projects at the initial planning stage through supporting the development of polices and plans, it may transmit the information on the future infrastructure project opportunity in the partner cities to companies in Yokohama, enabling the companies to engage in marketing activities at an early stage.

4.8 **Business project realization support:** Support in the realization of individual development projects promoted under the urban development plans and related policies. The City of Yokohama will provide knowhow accumulated through past similar projects. Yokohama may become involved as an advisor on technical, operational and financial aspects and/or as a coordinator for facilitating discussions among potential project implementers mainly during the project formulation period to enable a smooth and effective realization of the project. The City may provide advice based on its experience in having the private sector involved (urging participation) and experience in establishing and promoting business models such as infrastructure programs through PPP. It could also share the importance of adaptation of advanced technologies, such as those which the City's companies possess and were actually adopted in the City of Yokohama, in order to solve a long-term infrastructure issues faced by the partner cities. Introducing the City's companies with applicable technologies and services to the partner cities depending on their needs could also be useful both for these partners as well as the City's companies which are seeking business opportunities in emerging countries. It is preferable that the City simultaneously transmits information on the need and business opportunities in partner cities to its companies, and provides overseas entry assistance that will include the provision of basic local information, specialist consultation and global human development support as proposed in Chapter 2.

4.9 Specific method of assistance would be the same as for (1). Yokohama City's employees or former employees may participate in the "Urban Development Task Force" and "Sub-committees by sector" (both are referred to later in this document) as specialists, to act as an advisor/coordinator in cooperation with JICA consultants, if adequate. For sectors in which business expertise has already been shared/transferred to the private companies, cooperation with those companies (e.g. Yokohama Water Co., Ltd. for water & sewerage, Yokohama Port Corporation for ports) would be effective, as they are currently in charge of actual infrastructure management in Yokohama City. As these companies have a strong interest in overseas business, it is possible that they may contribute more directly in the form of equity investment in actual projects, instead of acting only as an advisor/coordinator. As a part of the coordination task, Yokohama City may also provide

assistance in financing of the project by applying for JICA or other donor's F/S support programs in cooperation with the company, investor, and/or local government employee of the subject country, or, by providing support in the preparation of proposal documents.

4.10 **Support in capacity building and establishment of regulative systems:** This may include the provision of capacity building programs to municipality employees and public company/affiliate employees on the method of designing/implementation of various regulations and guidance measures, method of implementation for urban development projects, and method of management or operation for infrastructure under their responsibility.

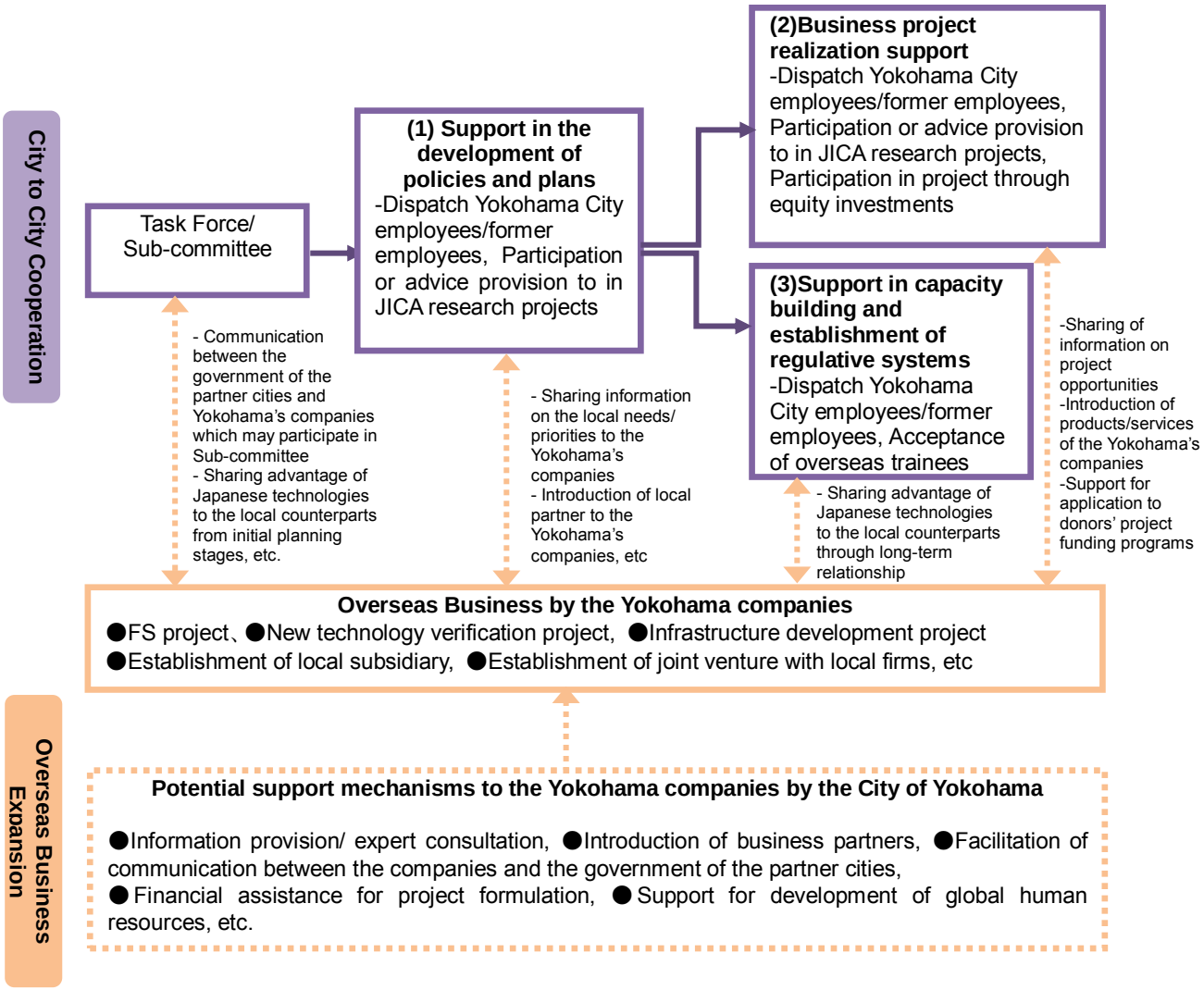
4.11 For realizing an effective urban planning and development projects (including PPP projects), support may be provided in the introduction of various regulations and guidance measures for urban management as well as in the establishment of a regulative/organizational foundations to facilitate new type of development projects, such as PPPs and carbon reduction initiatives. Specific assistance methods would include the acceptance of trainees that are municipality employees or public company/affiliate employees of partner cities by Yokohama City government and companies in the City, in addition to dispatching specialists who are Yokohama City employees or former employees to the partner cities. Acceptance of trainees would not only contribute to the partner city, but also would be an advantage for Yokohama's SMEs that are seeking business opportunities in developing countries, as they will be able to secure human resource with good knowledge of the local market and provide information to the local people on the advantage of Yokohama companies' technology (increase the possibility of Japanese companies' overseas expansion in the long-term). In addition to this, consultants with good knowledge of developing nations and the Yokohama City may collaborate, through JICA's existing technical cooperation programs.

4.12 The flow shown below indicates the framework and the supports promoted in the city-to-city cooperation initiative between Yokohama and its partner cities, as well as Yokohama's support for the City's company's efforts in expanding overseas business through the Urban Development Task Force and the Sub-committees by sector.

4.13 For a comprehensive urban development, the partner city may need to designate or establish a special unit that can coordinate the overall urban planning, select projects that should be prioritized, and allocate necessary budgets, as can be seen from the case with Yokohama's Planning and Coordination Bureau which pursued an interdepartmental urban management. Such unit should be placed directly under the mayor or the state governor and be granted authority to drive necessary measures. This unit (the "Representative Contact") should be able to function as the driver of intercity cooperation, including support for comprehensive urban development. Then, the Urban Development Task Force and Sub-committees should be established, the Representative Contact and other departments from both Yokohama and the partner city being the members, to function as the catalyst in promoting city-to-city cooperation and urban development, which in turn should support policy/plan development, business project realization, capacity building and regulative system establishment, and furthermore lead to a stronger intercity cooperation. At the same time, any information on business opportunities obtained at an early stage from this cooperation will be provided and support be provided to the City's companies in their marketing activities by way of introducing related parties, which should contribute to increasing the chance of companies successfully winning projects and in supporting

developing nations through introducing the companies' technology in the local market. In the next section, we will describe in details how the Representative Contact, Urban Development Task Force and Sub-committees will be formed and operate.

Figure 4.1 Flowchart of City to City Cooperation by Public-Private Partnership

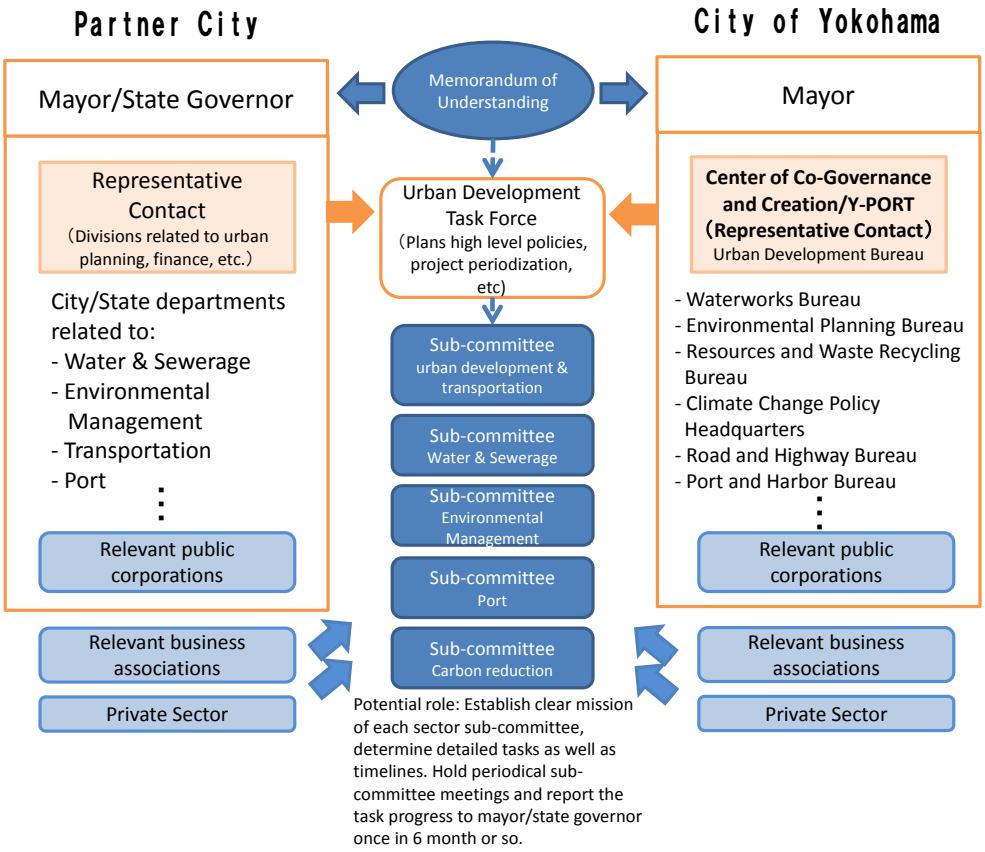


Source: JICA Study Team

2) Establishment of an organizational structure for international cooperation and business development

4.14 There have been efforts made in intercity cooperation at many municipalities in the form of "sister cities", but their activities were limited to a small-scale cooperation, such as technical cooperation for individual infrastructure projects or the acceptance of trainees, and there were few cases where two cities fully collaborated in order to facilitate a comprehensive international cooperation as well as business partnership. For promoting the cross-sectional cooperation and business development described above, it is necessary to for Yokohama and the partner city to together establish a permanent Task Force, which consists of the Representative Contact and other relevant departments of each city as members, clarify the goal and purpose of the intercity relationship, and engage in regular and continuous discussions.

Figure 4.2 Proposed Organizational Structure for International Cooperation and Business Development among Cities



Source: JICA Study Team

4.15 In order to enable continuous discussions and exchange of information, the Representative Contact, or an organization designated to promote intercity cooperation, firstly needs to be clearly assigned in both Yokohama and its partner city/state. Since the city-to-city cooperation mainly focuses on urban planning/urban development, it is preferable that the department(s) in charge of urban planning/construction or finance department that manages the budget for the individual projects be appointed as the promoting body. For example, the following organizations can possibly assume this role at the subject cities.

Table 4.1 Promoting Agencies for City to City Cooperation

City	Representative Contact/promoting organization	Other relevant agencies	Note
Da Nang	DPI	DOFA	DOFA is in charge of coordination with Yokohama City while DPI is responsible for coordination of JICA projects.
DKI Jakarta	Governor's Office	Public Works Agency、BAPPEDA	—
Makassar	MMDCB	-Spatial Planning Agency of South Surawesi -BAPPEDA	Coordination is necessary between agencies related to regional plans, since Makkasar City is the center of Maminasata and South Surawesi.

Source: JICA Study Team

4.16 In addition to the Center of Co-Governance and Creation (Y-PORT), which currently drives intercity cooperation efforts in Yokohama City, its Urban Development Bureau, which is responsible for Yokohama's urban planning, may also participate.

4.17 With participation of the promoting body and major relevant organizations specified above, the "Urban Development Task Force" will be established as an upper consultative organ for planning and promoting specific initiatives relating to this cooperation. For smoothly promoting the initiatives, it is preferable that the number of members be limited, as too many participants will require excessive time in making decisions and the function may lose substance.

4.18 As a lower branch of the Task Force, Sub-committees for each infrastructure sector should be established that will consist of representatives from the local governments' relevant departments, public companies relevant to the sector, and members from private companies as appropriate, in order to promote the selection of priority projects for each sector and to develop and implement individual project plans. Potential members of Sub-committees can be the following.

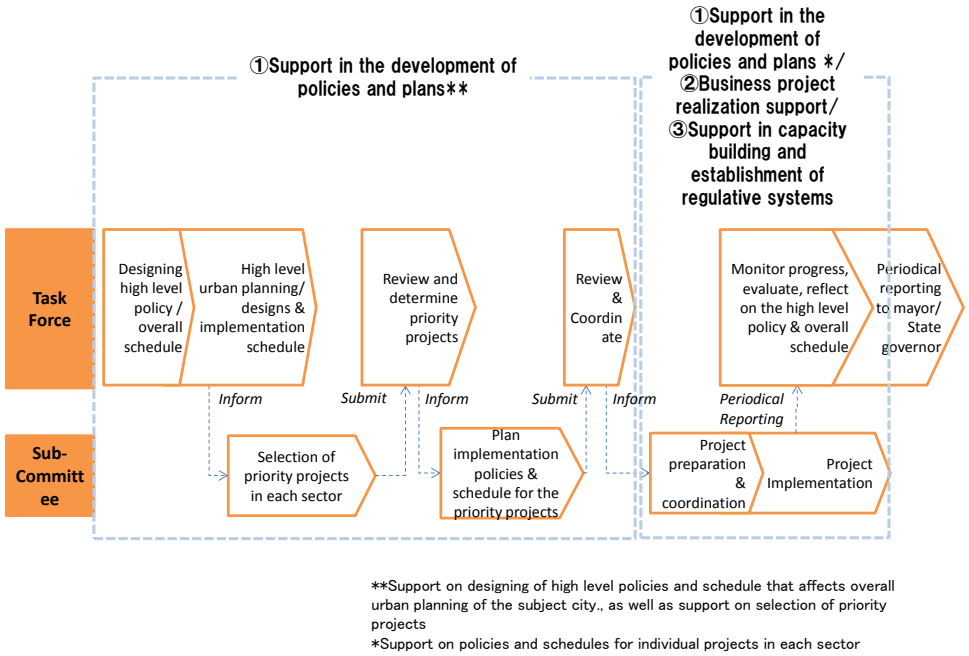
Table 4.2 Potential Members of Sub-committees by Cities

City	Potential Members
Da Nang	• Urban development: DOC • Transportation: DOT • Water & sewerage: DONRE, DAWACO • Environment management: DONRE, URENCO • Port: DOT, Da Nang Port
DKI Jakarta	• Transportation: DOT of DKI, BAPPEDA • Water & sewerage: Environment Management Agency DKI Jakarta (BPLHD), PD Pal Jaya • Environment management: BPLHD • Carbon reduction: Environment Management Board, Green Building Council Indonesia, Dept. of Industry and Energy, Energy Management Indonesia, BAPPENAS
Makassar	• Urban development: Dep't of Spatial Planning and Housing • Transportation: Dep't of Road, Dep't of Transport • Water & sewerage: Dep't of Infrastructure, South Sulawesi BAPPEDA • Environment management: Dep't of Environment • Port: PELINDO IV, Makassar Port Authority, Transportation Agency Province
City of Yokohama	• Urban development: Urban Development Bureau • Transportation: Road and Highway Bureau, Urban Development Bureau • Water & sewerage: Waterworks Bureau, Environmental Planning Bureau, Yokohama Water Co., Ltd. • Environment management: Resources and Waste Recycling Bureau, Environmental Planning Bureau • Port: Port and Harbor Bureau, Yokohama Port Corporation • Carbon reduction: Climate Change Policy Headquarter

Source: JICA Study Team

4.19 Particularly for the development and implementation of specific infrastructure project plans, we assume that companies that are interested can be identified for participating in the Sub-committees as appropriate, for engaging in specific discussions on potential feasibility studies or verification projects of the infrastructure business. Sub-committees do not have to be uniformly established for all of the above mentioned sectors, but could be established only for the sectors of priority at least at the initial cooperation stage, depending on the high level policy of the Task Force.

Figure 4.3 Proposed Roles and Tasks of Task Force and Sub-committee



<Roles of the Task Force>

- Design goals and implementation policy relating to how to proceed with the intercity cooperation initiative, development of the overall schedule, establishment of Sub-committees
- Design high level urban planning policies and implementation schedule (including review of existing urban plans)
- Notice to Sub-committees for each sector, request for submission of proposed priority projects (including both international cooperation programs and infrastructure business projects)
- Determine priority projects for sector, considering the relation between the proposal from Sub-committees and the high level urban plans
- If necessary, support the Sub-committees on the development of implementation policy/plans for priority projects, review and modify the contents
- Monitor, assess progress of individual projects and provide feedback to relevant parties, reflect the results in its high level urban plans and schedule if necessary
- Periodically report the overall progress/assessment of the overall intercity cooperation framework and individual projects to the mayor/state governor of both cities

<Roles of the Sub-committees>

- Select priority projects for each sector (relevant parties to review and examine the priority project list, which was extracted during this study, listed later in this document)
- Create a list of specific priority projects, submit to the Task Force for a review and approval
- Develop implementation policy and plan for the priority projects approved by the Task Force review
- Preparation for project implementation and coordination between relevant stakeholders
- Implement project, report periodically the status to the Task Force

Source: JICA Study Team

4.20 In terms of high priority international cooperation and infrastructure projects, this study proposes the following list of projects for each subject city as shown below. The list shows projects we consider should be handled with priority in particular, based on the "Possibility of international cooperation and business development" extracted in Chapter 4.2 and on the above "1) (1) Approach for international cooperation and business development". The Task Force and Sub-committees described above need to review this list, discuss and narrow down as official priority projects, taking into account stakeholders' opinions and investors' interest as well.

(2) Potential of International Cooperation and Business Promotion by Sectors

1) Urban Development Sector

(1) International Cooperation

4.21 Leaders of the city show a long-term vision based on the consensus of stakeholders, in order to realize it, Yokohama conducted various approaches such as formulation of regulations and guidance for growth management, human resources and organizational reform, extraction of priority projects, securing financial resources, coordination with stakeholders including private sector and national government, community participation mechanism from the planning stage, etc. These are common in Japan today, which Yokohama initiated them for the first time in the whole country.

4.22 Promotion of business and strategic development of new mechanisms, various challenges coordination with the existing legal system and coordination with the various stakeholders, such as funding is accompanied. Yokohama can share these experiences how to overcome the challenges to meet with demands and characteristics of developing cities.

(2) Business development

4.23 Large companies that have technology cooperation with Yokohama City have experience in urban development and infrastructure development large-scale, new technologies such as the environment. As well as environmental technology individual, such as a company that is participating in YSCP particular, the know-how of comprehensive infrastructure development and management infrastructure in the urban development of smart cities and smart communities, urban transportation, energy, water, and information. In developing cities, for industrial park development and new town development, station area development, the know-how and these new technologies can be applied for area management with environmental friendly and cost saving in long-term.

4.24 Small and medium-sized enterprises that creativity and competitiveness, can mainly provide in infrastructure and technology environment, through pilot projects at the district level, to experiment to apply for technology and equipment. As seen in MM21 District for demonstration of various experiments by private sectors collaborating with the City, in developing cities, demonstration experiment in the "Urban Development Special Zone" will be possible where the local government invite companies and institute with institutional support for investment promotion and technical development.

4.25 Urban development is a wide range of fields, including the related sectors, and has experience in urban development and management is a whole local government primarily. Therefore, in conjunction with technical assistance for the foundation of urban development, such as institution building and human resource development, while up to the required field the technology possessed by the private sector, and the like aim the ripple effect to the city and other areas, in public-private partnerships it is desirable to proceed.

Table 4.3 Direction of International Cooperation and Approaches for Urban Development Sector

	Assistance Needs	Available Support and Technology of Yokohama	Direction of International Assistance and Approaches
Urban planning and development	Improvement of urban plan institutional mechanism	Establishment of new institutional system for urban planning • Urban growth boundary for controlling urban sprawl • Land development guideline for development permit process • Urban redevelopment and land readjustment project implementation mechanism • New residential area and new town development	• City-original regulations such as landuse management and development permit • Development standard of residential area • Urban development project guideline
	Human resource development	• OJT for urban management administration in Yokohama City • OJT for technicians and engineers in companies in Yokohama City	• Dispatching experts from Yokohama City • Establishment of Expert Groups of retired staffs of Yokohama City • Training at companies (potential for business matching)
	Restructuring of urban management administration	• Urban plan formulation procedure • Organization (Planning coordination office, Urban design office, etc.)	• Organizational restructuring and capacity development in line with overall process of urban planning and development
	Formulation of city development strategy	• Visioning process and realization • Sharing experiences and know-how of 6 major projects of Yokohama City	• Reviewing and advising of existing master plans • Issue analysis and visioning • Implementation program (priority, coordination, financing, organization, etc.)
	Pilot project for smart city development	• Sharing experiences of smart city project	• Study on application to new development areas and large-scale facility development
	Collaboration with universities	• Promotion of joint research with universities in Yokohama City	• Human resource development and joint technical development
	Promotion of MICE	• Development and operation of conventional facilities • Organization of international events	• Strengthening of MICE function with advantages of resort, world heritage, international airport, etc.
	Infrastructure development and O&M	• 100% coverage of sewerage • Reduction of solid waste (G30)	• Development and expansion of sewerage facilities • Treatment of river • 3R campaign
	High-tech park and attraction of enterprises	• Policies to attract investment (tax benefits, etc.)	• FDI to industrial park • Industrial park prioritized for companies in Yokohama City
	Development and maintenance of roads and bridges	• Technical assistance for maintenance	• Dispatching experts
	Urban design	• Urban design guideline	• Incentives of application of public space
	Housing development for low and middle income groups	• Public housing development	• Supply system of public housing, subsidy, housing loan with low-interest
Socio-economic development	Investment promotion of IT industries	• Policies to attract investment (tax benefits, etc.)	• Induction of advanced technologies • Collaboration with universities and institutes
	Support for SME promotion for overseas business	• Information provision • Needs matching	• Seminars, workshops • Advisory and consultation
	Tourism development	• Capacity development program of service industries	• Promotion of tourism campaign

Transport	Traffic management	• ITS, GIS	• Bus operation system improvement
	Bus transport development	• Bus network improvement	• Capacity development of bus operation
	Traffic safety	• Campaign and education • Signal, pedestrian space	• Road traffic management
	Parking management	• Compulsory parking development • Public parking space development	• Measures of parking management
	Pedestrian network	• Barrier-free standard	• Urban design and beautification of pedestrian spaces
	Streetscape improvement	• Urban design guideline	• Height control of buildings • Streetscape planning
	Environmental-conscious vehicles	• Collaboration with Japanese auto industries	• Introduction of electric vehicle • Incentives for EV utilization
	Public transport network development	• Formulation of development concept of mass rapid transit oriented compact city	• Bus network plan in consideration of future MRT lines • FS for MRT development

Source: JICA Study Team

2) Environmental Management and Solid Waste Management

4.26 Implementation of appropriate environmental management and solid waste management has just been started and it is in the situation where the implementation for structuring of management system, construction, operation & management of infrastructures must be hasten to cope with the better quality of life, environmental conservation and climate changes. There are a number of cities that require immediate development of the facilities for the country facing with populous cities. From the degree of impact on the environment, implementation of the projects in the large cities with a population of more than one million as the target cities is effective.

4.27 With regard to the business development of environmental field by the private companies in Yokohama, a consortium participated with EX Research Institute Ltd. and JFE Engineering Corporation, etc. is implementing preparatory survey of the JICA's program for supporting infrastructure development and improvement of public services through PPP (Public-Private Partnership), but the project is not yet too commercialized. Also entrusted by the Governmental Commission on the Projects for ODA Overseas Economic Cooperation on support of small and medium-sized companies utilizing ODA under the Ministry of Foreign Affairs in 2013 fiscal year, Osumi Co., Ltd. in Yokohama is implementing "Project Formulation Survey" for the energy saving diagnosis using the "Simplified Measurement Method" and environmental education promotion. This project is aiming at applying the simplified and inexpensive diagnostic technique compared to the conventional methods to the factories for improving the environmental management capacity. With regard to Yokohama for supporting business development of these F / S study, it is desirable to back up in such a way for supporting the request for project application, attendance and negotiations with Da Nang City.

4.28 In addition it is also conceivable to target the active small and medium-sized enterprises like the company mentioned above, to strengthen the support of human resource development, etc. to overseas expansion of the companies. Meanwhile, there was a company wishing to carryout business in the field of environmental management in Da Nang City and applied to the government support scheme but the company was not adopted due to high competitive rate of F/S support program by the government. According to the company, the interest of Da Nang City was high for the business proposal

but there exist such a case that the lack of F/S budget has become a bottleneck for implementation of the project. As described above, there is a room for consideration for granting the expenses by local governments, but there are possibilities of support in a way of such activities for providing advices and collaborating preparation of the proposal.

Table 4.4 Direction of International Cooperation and Approaches for Environmental and Solid Waste Management Sector

Assistance Needs		Available Support and Technology of Yokohama	Direction of International Assistance and Approaches
Environmental Management	Environmental Consideration Model City for Demonstration Experiment (energy saving, measures for climate change, traffic congestion, etc.)	• Actual Performance of Smart City Project／Eco-model City • Yokohama Environmental Consideration System for Building	• Support for Urban Planning and Urban Development with Environmental Consideration • Transportation Demand Management • Development of Public Transport • Support for Introduction of Next-generation Vehicle
	Support for Formulation of Global Warming Measure Plan	• Yokohama Regional Warming Action Plan（CO-DO30）	• Support for Urban Planning and Urban Development with Environmental Consideration • Implementation of Clean Development （CDM）Project
	Support for Capacity Building for the Staff of Environmental Management Implementing Agencies	• Training of the Staff in Yokohama	• Dispatch of Experts from Yokohama • Establishment of Expert Organization composed of Retired Staff of Yokohama
	Installation of Auto Water Quality Monitoring Station	• Technology Transfer of the Monitoring System in Yokohama Environmental Monitoring Center	• Support for Procurement of Monitoring Equipment, etc. • Technical Transfer for Development and Operation of Monitoring System
	Pollution Measures as Large City (Measures for Residents)	• Complaints Management related to Pollution／Administrative Guidance	• Dissemination of Pollution Prevention Manager System
Solid Waste Management	Support for Formulation of Integrated Solid Waste Management based on 3R and Selection of Priority Projects	• Yokohama G30 Plan	• Support for the Implementation of Waste Segregation, Awareness Campaign/ Education for 3R
	Drastic Waste Reduction Generating Huge Amount of Municipal Waste in Large Cities	• Yokohama G30 Plan	• Development of Combustible Waste Incineration with Power Generation Plant (Use of Renewable Energy)
	Development of Intermediate Treatment Facilities through Waste Segregation and 3R	• Declaration of Environmental Action City • Yokohama G30 Plan • Promotion of Group Recovery	• Bio-gasification Plant • Composting Plant • Resource Separation/Recovery Plant
	Aging of Waste Collection/Transport Vehicles	• Introduction of Low-emission Type Vehicles • Introduction of Private Sector	• Support for Procurement of Low-emission Type Vehicles
	Operation Management for Sanitary Landfill	• Training of Staff in Yokohama	• Support for Preparation of Sanitary Landfill Operation and Management • Implementation of Pilot Project
	Operation Management for	• Training of Staff in Yokohama	• Operation Management for

	Regional Landfill		Regional Landfill（There is a pan of JICA technical cooperation project.）
	Establishment of a Financial Support System	• Yokohama Medium-term Financial Vision (formulated in October 2003) • Introduction of Corporate Accounting Method • Introduction of Deposit System ／Environmental Tax (Plastic Bages, etc.) • Introduction of Private Sector	• Introduction of Corporate Accounting Method

Source: JICA Study Team

3) Water and Sewerage

(1) International Cooperation

4.29 Many issues on water supply & sewerage sector in the city of developing countries are confirmed and there are various assistance needs. Especially in the sewerage sector including drainage sector, there are big potential of international assistance because facility development will start from now. Yokohama's history of water supply & sewerage just overlap on the assistance needs in the city of developing countries. A lot of experiences, knowledge and technologies of Yokohama are available for the international assistance.

4.30 In many cities of developing country including the target 3 cities of this survey, an infrastructure development of water supply and sewerage has delayed and an expansion of its market is anticipated. Water supply system, which has developed partially, are facing some problems such as deterioration of existing facility, lack of facility capacity and high rate of water leakage, and furthermore a development of sewerage system has totally delayed since its low priority among other public infrastructures. These circumstances means there are many needs in the city of developing countries for water supply and sewerage projects on various stages from upstream to downstream of the projects, such as 1) Planning & design, 2) procurement of material & equipment, 3) construction, 4) O&M of facility. It is anticipated that Yokohama city can provide their assistance on, for instance, master plan formulation of phased facility construction, leakage control of existing pipe for efficient O&M, planned reconstruction of deteriorated facility, project management with sustainable tariff structure and management of industrial wastewater etc.

4.31 Yokohama city has had many experiences of international cooperation on water supply and sewerage sector, which include capacity building in developing countries, with JICA and private company in Yokohama. It is expected to provide international assistance for major needs of the three target cities in future.

Table 4.5 Direction of International Cooperation and Approaches for Water Supply & Sewerage Sector

Assistance Needs	Available Support and Technology of Yokohama	Direction of International Assistance and Approaches
➢ **Facility development and expansion for water supply and sewerage:** - Elimination for gap of facility development between urban area and rural area - Development of stable and safety water resources - Utilization of On-site (small-scale) system - Improvement of safety level of flood control by installation of run-off control facilities	■ **Phased development based on long-term plan** Long-term plan for water supply & sewerage is formulated with reflection of social dimension such as demand forecast based on population projection and it is coordinated with other city planning such as large-scale development plan. Based on such a long-term plan in which social and economic condition are reflected appropriately, phased development by various approaches including PPP project achieves effective project implementation.	**Development of Infrastructure** - Expansion of Water treatment plant, distribution tank and pipes - Planned reconstruction for deteriorated facilities of water supply - Sewerage development for main facilities such as WWTP and trunk sewer - Development of wastewater treatment facility for industrial park and large-scale housing land developing area - Installation of individual treatment facility (septic tank, etc.) - Installation of run-off control facility - Development of reclamation facility and sludge recycling facility
➢ **Rebuilding of deteriorated facilities:** - Effective operation of existing facility (incl. reduction of water leakage) - Planned reconstruction of aged facilities	■ **Effective operation of facilities** Improvement plan for deteriorated facilities is formulated and planned rebuilding projects are implemented. Planned O&M and rebuilding, not stopgap measures, is adopted for water leakage problems and achieves NRW (Non-Revenue Water) ratio of less than 10% Water supply by distribution block system, in which the city is divided into 26 blocks, makes water pressure control in distribution blocks simple and achieves effective operation by mutual accommodation of each block.	
➢ **Promotion of recycling system:** - Development of reclamation facility - Development of sludge recycling facility	■ **Development of recycling system** Recycling system is actively promoted reflected by growing social needs of environmental conservation. Solar energy generation, small-hydroelectric power generation and bio-gas power generation are utilized for recyclable energy. In addition, treated water with advanced wastewater treatment is reused and sewage sludge is utilized for cement raw material and improved soil. These activities increase project efficiency and contribute for formulation of recycling-oriented society with reduction of greenhouse gases.	
➢ **Formulation of business plan:** - Setting of water & sewerage tariff structure for sound financial management with profitability	■ **Project management by self-support accounting system** Water supply projects are managed by business accounting system with water charges basis based on the law of local public enterprise. Medium term business plan promotes efficiency of project management and makes a profit continuously. Yokohama has adopted a rate structure in which water charges are set in accordance with usage categories such as for households and for business use, and in which the unit charge in increased on a progressive basis in proportion to consumption volume. In this system, lack of revenue for setting a water charge of household at low rates is recovered by revenue of water charges for business use.	**Strengthening of Project Management** - Capacity building for staff of related agencies - Formulation of phased development plan based on long term planning - Formulation of master plan for sanitation including on-site system - Management of industrial wastewater - Formulation of comprehensive flood control plan
➢ **Control of Industrial wastewater:**	■ **Development of industrial wastewater treatment facility**	

Assistance Needs	Available Support and Technology of Yokohama	Direction of International Assistance and Approaches
- Development of treatment facility for factories and large-scale housing land development - Establishment of monitoring system	For effective facility development, related regulations and guidelines are established for industrial wastewater and leads private sector to install treatment facility. Effluent quality standard of industrial wastewater are set and obligates private sector to install industrial pretreatment facility. In addition, large-scale housing development is also obligated to construct small scale sewage treatment plant. These facilities are developed on responsibility of private sector with their own expense and it promotes effective development progress. Industrial wastewater is checked continuously by water quality monitoring system in which sampling/analysis of effluent water and instruction/penalty to private sector are carried out.	- Formulation of medium term business plan - Establishment of water & sewerage tariff structure stand on profitability - Development of legal system for PPP project
➢ **Promotion of PPP project:** - Development of legal system for PPP project - Promotion of active entry by private sector for PPP project (Development of project scheme for private sector utilization) - Strengthening of public relation activity for citizen's participation	■ **Implementation of PPP projects** PPP and citizen's participation projects are implemented to utilize knowledge and experiences of private sector for problem solving and regional vitalization. Project for renewal of water treatment plant, sludge recycling facility and power generation using digestion gas are implemented by PFI in which private sector is responsible for design, construction and operation of facility with project management. Operating agreement by performance contract, in which contractor is requested to meet demand standards, are also adopted for effective project implementation.	
➢ **Capacity building for staff of related agency:** - Capacity building for Facility O&M - Capacity building for project operation and financial management	■ **Promotion of International Cooperation** Technical cooperation on water works for developing countries, in which assistances for technology and project management of waterworks are required, has actively conducted by dispatching the experts and acceptance of trainees through JICA/CITY NET projects. These projects also aim at staff capacity development of the Yokohama city for international contributions through the experiences different from daily work in Japan.	

Source: JICA Study Team

(2) Business Opportunity

4.32 In the past, private companies have deployed overseas business in mainly ODA projects implemented by government-to-government (G to G) basis and a participation of, especially, medium and small companies for overseas project was very limited. To improve such a circumstance, Yokohama city has established "Yokohama Water Business Conference (YWBC)" on November, 2011. YWBC has been taking various actions for seminars, workshops, and fact-finding missions in collaboration with Y-PORT. These activities by YWBC are effective for private companies and to support them by an information sharing and development of business chances. YWBC prepared a mapping chart for specific business fields of each member company. As stated in Chapter 2, many companies in water sector have specific technologies and needs business partners for overseas deployment. This mapping chart is available for picking up and partnering of appropriate companies to support various needs in the city of developing countries and it should be utilized effectively.

4.33 Furthermore, “Yokohama Water Company (YWC)”, which was established in 2010 with 100% investment by Yokohama Waterworks Bureau (YWWB), has deployed overseas business actively. YWC has carried out technical assistance project in the world. They also participated in feasibility study for PPP project at Indonesia, Viet Nam, and implemented demonstration experiment with JGC Corporation in Saudi Arabia. As regards an overseas operation by public corporation, which accedes to know-how of water supply and sewerage project in municipalities, there is a project for industrial park at Long An province in Viet Nam by Kobe-water Service Company collaborated with Kobelco Eco-Solutions Co., Ltd and Shinsho Corporation. YWC has currently not got full-scale overseas operation yet but there is enough potential of overseas business expansion by continuing activities in cooperation with Y-PORT. Especially at Danang city, YWC have contracted with JICA for “The preparatory survey for water supply project in Hoa Lien (PPP infrastructure project)” collaborated with Kajima Corporation, Hitachi, Ltd., Original Engineering Consultants Co., Ltd., Global Water Recycle and Reuse System Association (GWRA), Sumitomo Mitsui Banking Corporation, and Nishimura & Asahi. In this survey, feasibility study of Water Treatment Plant has already started from June 2013 and project implementation in near future is expected. As a feasibility study of environmental management mentioned before, for actual project implementation, international assistance by Yokohama city is desirable. Even though YWC forms project consortium with mainly major company at present, YWC have set a policy of partnership with member companies of YWBC for future overseas business expansion. Thus, overseas business deployment of medium and small company in Yokohama is expected by cooperation with YWC.

4) Ports and Logistics

(1) International Cooperation

4.34 The ports in the cities of Danang and Makassar both require expansion of port facilities due to the increasing volume of freight and the enlarging scale of vessels. Danang Port is already reviewing the expansion of the Tien Sa Port through Japanese ODA, and at Makassar Port, a 3-phased PPP project plan (Phase 1 to be implemented by a state-run company in the traditional way) is under consideration. Meanwhile, Danang City faces inability to manage the entire port comprehensively and establish port development plans in such way to optimize the use and operation of the entire port area, due to the lack of “port authority”. The local authority as well as Da Nang Port expressed their need for overseas assistance in establishing the port authority function in Vietnam accompanied with appropriate capacity building supports on its operation and the necessary skills to produce development plans for the entire port area. Yokohama City has been acting as the port authority of the Port of Yokohama, overseeing and having created comprehensive development plans for the entire port. The long-term plans were often designed to divide development works in several stages, carefully paying attention to the correspondence with the demand shift. Based on these experiences, Yokohama may dispatch specialists or accept trainees for building the capacity of port authority once the function is established in Vietnam. There is also a need for improving the capacity of the Makassar Port Authority that has been already established, and yet as its human resources and skills are so limited that they face significant challenges and are even unable to sufficiently collect harbour charges from port users. Assistances may be provided by establishing appropriate operational structures and transferring practical skills/knowledge, based on Yokohama

City's experience.

4.35 In addition, the computerization of port entrance/leaving management, container tracing and customs clearance are also being sought. Currently, Japan's NACCS and CIS systems are being introduced through grant aid, but there was also a request for technical training support to fully utilize and operate the new systems. Yokohama City may promote technical assistance and training supports in the area of operational knowhow after the computerized facilities are introduced.

4.36 There is also a need towards improvements in quality of handling cargo, as the loading/unloading operation is inefficient and occasionally damages are found in the handled cargo. Yokohama City is known for its high handling efficiency, and is appraised highly by foreign shipping companies. This greatly depends on the knowhow of workers engaged in handling cargo and not on mechanization. In future, Yokohama and loading companies may cooperate to provide consulting services based on their method and engage in human development.

4.37 As Yokohama City's Port and Harbor Bureau and the Yokohama Port Corporation already have accepted many overseas trainees and are experienced in international cooperation, same as for water and sewerage sectors, an ever focused response to the areas of priority needs, such as the mentioned above, can be expected for the near future.

Table 4.6 Direction of International Cooperation and Approaches for Port Sector

Assistance Needs		Available Support and Technology of Yokohama	Direction of international Assistance and Approaches
Port	• Preparation of a development plan for the port and surrounding area - Preparation of a totally optimized development plan for the overall port area, corresponding with future demand	■ Development of a totally optimized development plan, integrated management. -The City that is the port authority has been effectively developing and expanding the overall port, according to the changing freight demand. It has also been engaged in disciplined operation, including the establishment of a transparent tariff structure	• Capacity development and support in establishing the structure for the port authority function including management of the overall port, promoting development and collecting charges
	• Development of the port authority function - Capacity development and knowledge/skills transfer for the port authority		
	• Improvement of port entrance and leaving/customs administration - Establishment of effective management structure/method, information management (container tracing) - Computerization of customs clearance procedures	■ Promotion of computerization - Computerization of port entrance/leaving management and customs clearance are well-adopted, and operational knowhow accumulated	• Capacity development and establishment of effective operational structure following the future computerization
	• Improvement of container terminal operation: - Transfer of skills on an effective cargo handling and other port operations	■ Highly efficient/high quality cargo handling skills - Yokohama has efficient and safe cargo handling skills that are highly appraised by global shipping companies	• Consulting on cargo handling skills, support in employee trainings

Source: JICA Study Team

(2) Business development

4.38 As stated above, Danang Port is planning to expand its terminal as an ODA project, and Makassar Port as a PPP project. Both plans have not been determined yet and attention should be paid on the future progress. There is a room to review the possibility of, for example, Japanese companies' participation in the Danang Port ODA project, and cooperation with PELINDO IV, the state-run port operator, for the Makassar Port PPP project. Regarding the Danang Port, 25% of Da Nang Port Holding's shares are expected to be sold in the market, and acquiring such shares may allow deeper involvement in its port management.

4.39 This study was unable to identify companies in the City that were interested in the above mentioned business opportunities at the 2 ports. However, detailed requirements for both projects are yet to be determined, and by continuing to transmit information gained through Yokohama's city-to-city cooperation on the moves to the City's companies, there is future possibility of such cases leading to the project participation of the companies. It might worth for Yokohama City to maintain a good relationship and information sharing with the local relevant authorities as well as the port operator through city-to-city cooperation, so that in case the companies in Yokohama come to show an interest in these projects in near future, there could be a welcoming local environment for their participation.

4.40 As described above, there is a need towards Danang Port to reinforce its logistics network. There is a demand for Japanese companies that are able to construct logistics infrastructure facilities or to provide integrated logistics services to start business in Danang. On the other hand, interviews with Japanese logistics companies that have already entered the local market reveal that the volume of cargo handled at Danang Port as of now is small, and this is not yet the time to consider the need for such facilities or the expansion of business. However, as cargo volume at Danang Port is increasing annually as stated above, the expansion of the terminal, once realized, could increase the volume of freight being handled and produce an attractive opportunity to logistics companies.

4.41 Of the companies in Yokohama, Nissin Corporation provides truck transportation services between Vietnam-Laos-Thailand, using the East-West Economic Corridor, but the trucks load the cargo not at Danang Port but at Hai Phong Port, drive south to the central region, and then travel through the Corridor to transport to the adjacent country. The company's local office is located in Hanoi. However, Nissin Corp which also is engaged in land transportation between Hanoi-Ho Chi Minh wishes to reinforce its transportation system by establishing a stopover point in Danang, located in the central region[1]. If cargo volume were to increase as a result of expansion of the terminal, it is possible that truck transportation services may also expand between Danang and the adjacent country. As there are several Yokohama companies that have a base not in Danang but inside of Vietnam, Yokohama City may transmit information on the future possibility of Danang to these companies.

[1] Vinaboo article "Vietnam-Laos-Thailand, land route in 2-3 days! Nissin's Mekong Landbridge, 5 months from the start"

5) Carbon Reduction

(1) International cooperation

4.42 The Special Capital Region of Jakarta has needs for the method on awareness raising and educating the general public regarding the importance of energy-saving and carbon reduction, as well as for promoting citizens and private sectors' involvement and cooperation in the efforts. As Yokohama City has abundant experience and knowhow on having people participate in activities, as seen in "Yokohama G30 Plan", it is largely possible for the City to cooperate with Jakarta for establishing specific awareness raising programs, and for reviewing how to have the citizens involved during the course of such activities. Energy-saving regulations for ordinary households that consume a large amount of energy may not be easy, but Yokohama provides incentives such as subsidy on introducing HEMS at ordinary households as part of the YSCP (Yokohama green power model project), and the City may cooperate by way of sharing information on the effect and experience on implementation. However, it would be difficult for an incentive scheme alone to produce results, and coordination with sufficient enlightening and education programs is essential.

4.43 For designing an incentive scheme, an advice is sought not only from the government of the Special Capital Region, but the national government is also asking for policy proposal on the method for carrying out fiscal and financial assistance measures. As seen with Yokohama's 6 Strategic Projects and YSCP, the City has been utilizing national budget and grants for promoting large-scaled projects. From the perspective of a local government that has such experience and from the perspective of promoting overseas expansion of the City's companies, Yokohama is expected to contribute to the government of Indonesia's designing of its systems by providing opinion on effective assistance measures and through discussions with JICA's Indonesia office. The national government is further seeking advice on the land use plan in line with measures on climate change. There is room for consideration on the extent to which Yokohama can be involved in Indonesia's land use plan, but there is possibility of Yokohama being able to make a proposal based on its experience, as the City has been engaged in initiatives such as promoting the preservation of green space from the point of efforts against global warming, in addition to transferring knowhow on the preparation of such plan.

4.44 The Special Capital Region of Jakarta has also needs on the knowhow for financing project costs. As Yokohama has experience in cooperating with the national government for holding down its cost burden, it may share knowhow on sharing the vision and cooperating with other stakeholders, in addition to the policy proposal to the national government measures. The PPP project is one such example, and Yokohama may provide advice on how to establish a structure for the provincial government to handle such types of projects, on support for building capacity, and propose the possibility of utilizing Japan's assistance systems, including the JCM.

Table 4.7 Direction of International Cooperation and Approaches for Carbon Reduction Sector

	Assistance Needs	Available Support and Technology of Yokohama	Direction of international Assistance and Approaches
Carbon Reduction	・Energy-saving at ordinary households • Insights for such measures aimed to regulate ordinary residents' energy usage	■ Promotion of enlightening/education activities with involvement by citizens and operators - Yokohama has held many briefing sessions and enlightening	• Sharing of specific contents and success factors for Yokohama City's enlightening/ education activities

	through regulations and incentives, such as a packaged efforts of incentive systems and corresponding awareness raising campaigns ・Continued implementation/enforcement of measures • Knowhow for enforcing governmental policies through incorporating public /private sector participation in the effort of the policy implementation ・Awareness raising and educating of citizens • Knowhow on implementing enlightening activities for citizens • Education curriculum at schools, method for instructing school teachers or having them become aware	campaigns for citizens under programs such as "Yokohama G30 Plan", and has been engaged in awareness raising activities. It led the program to success by engaging in grass root education activities supported not only by government staffs but also by waste management leaders appointed in each neighborhood association and volunteer groups. In recent years, it has organized the "Yokohama Eco School" where companies, universities and administrative organs can participate in information exchange events and study sessions on measures against global warming. ■ Incentive designing, addressing ordinary households in particular - Under the YSCP, Yokohama City provides a subsidy (including government grant) for introducing the HEMS at ordinary households (Yokohama green power model project).	• Designing and operation support for enlightening/ education projects • Information sharing on specific contents, impact analysis and lessons learnt from Yokohama's incentive scheme for ordinary households, and provision of advice based on the above
	・Financing for infrastructure projects • Knowhow on financing project funds ・Development of fiscal/ financial measures by the central government • Establishment of support measures for promoting technical transfer through JCM, and PPP projects	■ Project promotion utilizing government assistance - For promoting large projects, the City has held discussions with the national government for utilizing national budget and grants. ■ Promotion of PPP projects - Including the YSCP, the City has been implementing projects jointly with private sectors, also utilizing existing F/S support programs.	• Proposal on assistance measures required from the perspective of a local government that has experienced cooperation with the national government, and from the perspective of an operator that promotes the overseas expansion of the City's companies • Advice on the method for utilizing private funds as well as F/S assistance programs for which companies can apply for, based on Yokohama's experience • Support to the provincial government for establishing an implementation structure for PPP projects
	・Development of a land use plan • Development of an extensive land use plan that respond to climate changes	■ Responding to climate changes within the land use plan - The City has experience in developing and implementing land use plans including green space preservation, etc., in response to measures on global warming.	• Advice from the experience on having developed land use plans that also takes account of measures on global warming

Source: JICA Study Team

(2) Business development

4.45 Local needs such as the use of biodiesel, stabilization of electricity at industrial parks, promotion of green buildings (technology including ESCO and EMS) and the spreading of energy-saving home appliances were recognized relating to the carbon reduction technology sector. These technologies have already been introduced and verified in the City of Yokohama, and by promoting overseas expansion of relevant companies, there is the possibility of leading these opportunities into joint projects with the Special Capital Region of Jakarta, or to business expansion by individual companies.

4.46 Indonesia has seen as a partner country in the Joint Crediting Mechanism so that numerous F/S has already been conducted in the country, including 49 projects supported by the Ministry of Economy, Trade and Industry (METI) and New Energy and Industrial Technology Development Organization (NEDO) and 16 projects supported by the Ministry of the Environment, including the projects related to biofuel and EMS. Although METI/NEDO have supported about 30-50 projects annually in the past, as of July 2013, the number has decreased to 13 (2 in Indonesia). During the Q&A session at the Government briefing seminar on JCM held in July, the METI explained that in future, the JCM's focus of support will be shifting from feasibility studies (F/Ss) to verification projects. For F/Ss, the policy will be to focus on technical areas and regions that have not been subjects of studies in the past. As so many F/Ss have already been conducted on the carbon reduction technology, the criteria for the JCM support eligibility could become stricter in future for new F/S projects.

4.47 Besides the above support system, JGC Corporation and Chiyoda Corporation have established a consortium with several other companies and are conducting a F/S in the surrounding region of Jakarta on a smart community project (utilizing FY2011 METI "Infrastructure System Export Promotion Study Project (study on the formulation of ODA loan/private sector infrastructure projects)"). The consortium is continuing to review the opportunity after the study, but have not yet reached the verification project stage due to reasons such as the slow speed of discussions with the Indonesian government, etc. Under such circumstance, it seems that starting business/projects on carbon reduction sector may have many issues.

4.48 Meanwhile, the Special Capital Region of Jakarta has developed its goal and action plan for reducing GHG. It has high interest in low carbonization as can be seen from the promotion of the "Green Building Code", and is enthusiastic over obtaining new technology and expertise. In order to facilitate business development in Jakarta in carbon reduction sector, the City of Yokohama should fully utilize the relationship with the Jakarta government, such as proposing a specific pilot/verification project which will be jointly executed by the two governments through their "G to G" partnership, during their inter-government talks. A possible approach would be, while deepening understanding of the counterparty government's needs through international cooperation including awareness campaigns and education activities, for Yokohama to provide a project proposal assuming participation by the City's companies, and to make efforts to gain Jakarta's understanding and support. For example, if it were difficult to introduce Yokohama's YSCP project model in the current form, one method would be to focus on green building which is of particular interest, and propose a BEMS introduction verification project targeting public facilities (facilities owned by the provincial government). In order to realize a substantive "intercity cooperation", a structure should be built which would enable continued dialogue between the governments and not remain at organizing several

interactions annually.

4.49 Furthermore, by sharing the contents of the city-to-city discussions /Jakarta's needs with the Yokohama companies and providing support to them when making a proposal to the F/S support programs organized by the national government, the fruits of city-to-city cooperation may lead to business. In order to win these F/S supports, which is highly competitive, appropriately understanding local needs and support from the local government are important factors. City staff that participated in discussions with the government of the Special Capital Region of Jakarta may act as a liaison between Yokohama companies and the provincial government for participating in preparing the proposal. At the same time, international cooperation with the Jakarta and Indonesian governments should be promoted as stated above, in order to build a favorable social environment for formulation of these projects.

4.50 On the other hand, the City may be able to further support initiatives such as those on the solar system (or solar hybrid system) for remote islands that Yokohama companies such as Uyeno Green Solutions or Inter Action Corporation have already engaged in and building experiences in overseas business in the sector. Although the current study targets the Special Capital Region of Jakarta, there are many remote islands in Indonesia and nearby countries that may be targets for these businesses. In fact, Uyeno Green Solutions that established a JV with a local company in the Philippines and is engaged in the solar power business, is conducting a feasibility study on a solar diesel hybrid system project for remote islands in Indonesia and Southeast Asia through FY2012 Ministry of Foreign Affairs' "Overseas Expansion of SMEs and ODA for Developing Countries." Through the study, the company has identified several specific candidate projects, and future progress is anticipated. Yokohama may approach municipalities in remote islands that could be targets for further encouraging the global expansion by companies already with track records. Although it may be difficult to execute a cooperation agreement with all candidate cities, Yokohama City's staff may individually visit the cities in order to build a relationship of trust, aiming to smoothly negotiate the project, or the City may strengthen backup support such as providing assistance in human development to such proactive companies.

(3) Proposal on International Cooperation and Business for Target Cities

1) Proposed Program for Da Nang City

4.51 In case of Da Nang City, the main counterpart for Japanese investment is DOFA and Investment Promotion Center, while DPI is the main for ODA programs and projects. It is necessary to clarify roles of each department with collaboration for implementation of a comprehensive cooperation program.

Table 4.8 Proposed Program of International Cooperation and Business for Da Nang City

	Program	Counterpart	Contents	
Short-term	(a) Technical corporation to industrial parks	DPI, Industrial Park PMU	OJT for technicians and engineers in companies and factories of Yokohama City, studying business potential to Da Nang City	3) institutional arrangement, capacity development
	(b) Japanese-Vietnam Communication and Human Resource Development Center	DOFA	Dispatching experts/ staffs from Yokohama City to the center to support cultural and technical exchange programs	3) institutional arrangement, capacity development
	(c) Urban design guideline formulation	DOC	Formulating urban design guideline to preserve skylines, building heights and townscapes	3) institutional arrangement
	(d) Traffic management and promotion of utilization of public transport	DOT	Proposal on promotion of public transport utilization and review of plans	1) Policy and planning
	(e) Introduction of MRT	DPI, DOT	Feasibility study for development of MRT integrated with urban development for compact city development	2) FS (PPP-FS, etc.)
	(f) Human resource development of tourism sector	DOEST	Improvement of service of resort and tourism facilities	3) Capacity development
	(g) Water supply	DONRE, DAWACO	Expanding waterworks and pipelines (FS is ongoing), rehabilitation plan of old pipelines and facilities	2) FS 1) policy and planning
	(h) Solid waste management plan formulation	URENCO	Formulating solid waste management plan with 3R program	1) Policy and planning
	(i) Waste intermediate treatment facility improvement	URENCO	Development and operation of intermediate treatment facility to utilize renewable energy Expansion and operation of hazardous waste and medical waste incineration facility	2) FS
	(j) Sewerage system	DONRE	Management sewerage from large-scale facilities Installation of individual sewerage treatment plant (septic tank)	1) policy and planning 2) FS
	(k) Computerized operation of port	Da Nang Port	Capacity development and management system development of operation of computerized system of port procedures	3) institutional arrangement, capacity development
	(l) Human resource development of handling cargo	Da Nang Port	Capacity development of handling cargo	3) capacity development
Mid and Long-term	(m) New town development	DOC	New town development plan formulation, public facility development, promotion of investment of Japanese firms	1) policy and planning 2) FS
	(n) Human resource development of port authorities	Port authority (not defined yet)	Establishment and capacity development of port authority	3) institutional arrangement, capacity development
	(o) Port development strategy by phase	Da Nang Port	Development of comprehensive port development strategy based on Yokohama Port's experiences	1) policy and planning

Source: JICA Study Team

2) Proposed Program for DKI Jakarta

4.52 Yokohama City proposes to work with DKI Jakarta for smart city development. Pilot project implementation, promotion and education to citizens, establishment of effective incentives and support mechanism are prioritized with potentials for cooperation.

4.53 Station area development of MRT stations is one of prioritized area, since JICA PPP F/S projects have been conducted, which experiences of Yokohama City can be studied and applied for. Especially know-how of urban redevelopment projects which is a special mechanism in Japan can be studied further.

4.54 Infrastructure development should be comprehensive such as G30 of solid waste management, flood control, intermediate treatment plant, etc.

Table 4.9 Proposed Program of International Cooperation and Business for DKI Jakarta

	Program	Counterpart	Contents	
Short-term	(a) Urban redevelopment of station area	DKI Jakarta	Advising implementation mechanism and institutional arrangement for urban redevelopment projects and intermodal transfer facility development	2) FS (advisory)
	(b) Solid waste management plan formulation	DKI Jakarta	Formulating solid waste management plan with 3R program	1) Policy and planning
	(c) Waste intermediate treatment facility improvement	DKI Jakarta	Development of intermediate treatment facility Formulation of facility development plan of DKI Jakarta	2) FS
	(d) Pilot project for low-carbon technology	Environment Management Board	Demonstration of BEMS and another technologies for green buildings	2) FS
	(e) Institutional arrangement for low-carbon society	Environment Management Board	Development of incentives and institutional arrangement for promoting low-carbon projects Formulation of measures for promotion and education for citizens	3) institutional arrangement
	(f) Policy provision for low-carbon society	MOF, Ministry of Public Works (working with JICA Indonesia Office)	Formulation of national policies to realize low-carbon society (support system, landuse plan, etc.)	1) Policy and planning (advisory)
Mid and Long-term	(g) Sewerage system	DKI Jakarta	Development and rehabilitation of basic sewerage system (plant and pipelines)	2) FS
	(h) Flood control	DKI Jakarta	Promotion of comprehensive flood control measures	1) Policy and planning 2) FS
	(i) Solid waste management	DKI Jakarta	Capacity development to realize comprehensive solid waste management Environmental education for 3R	3) Capacity development

Source: JICA Study Team

3) Proposed Program for Makassar City

4.55 Coordination between Mamminasata metropolitan area and Makassar City is indispensable, especially for regional infrastructure development such as roads and solid waste management.

4.56 Since Makassar City has already selected priority projects, so it is efficient to elaborate implementation mechanism supported by Yokohama City. Some of priority projects of Makassar City are similar to Yokohama's 6 major projects, such as CBD development, new town development, etc.

Table 4.10 Proposed Program of International Cooperation and Business for Makassar City

	Program	Counterpart	Contents	
Short-term	(a) Implementation of 11 priority projects	Mamminasata metropolitan area, Makassar City	Formulation of implementation mechanism of 11 priority projects in compliance with city's long-term plan and synergy effects between projects	2) FS 3) institutional arrangement and capacity development
	(b) Purification and beautification of river	Makassar City	Improvement of environment around river by cleaning of riverside and purifying of river	2) FS (promotion of beautification)
	(c) Waste segregation	Mamminasata metropolitan area, Makassar City	Capacity development to realize comprehensive solid waste management Environmental education for 3R	1) Policy and planning
	(j) Waste intermediate treatment facility improvement	DKI Jakarta	Development of intermediate treatment facility Formulation of facility development plan of DKI Jakarta	2) FS
	(p) Water supply and sewerage	Makassar City	Expanding waterworks and pipelines (FS is ongoing), rehabilitation plan of old pipelines and facilities	2) FS
	(d) Traffic management and street improvement plan of commercial district	Makassar City	Formulation of Traffic management plan of CBD Formulation of pedestrian network plan Formulation of landscape guideline based on experiences of Motomachi, Yokohama	1) Policy and planning 2) FS 3) Institutional arrangement
	(e) Tourism development	Makassar City	Study for needs and potential of tourism development, implementation of pilot projects for tourism	1) Policy and planning 3) Capacity development
	(f) New town development	Makassar City, private sector	New town development plan formulation, public facility development, promotion of investment of Japanese firms	2) FS
	(g) Eco-campus development plan	Hasanudin University	Promotion of eco-campus as a part of construction project of Faculty of Engineering (installation of solar system, etc.) Promotion of pilot projects by universities and joint research	2) FS 3) capacity development (technical cooperation)
	(q) Human resource development of handling cargo	PELINDO IV	Capacity development of handling cargo	3) capacity development
Mid and Long-term,	(h) Restricting of public transport network	Makassar City	Restructuring of bus network in corporation with priority of road network and mass rapid transit plan	1) Policy and planning
	(i) Traffic management of large-scale facilities	Makassar City	Formulation of guidelines of parking development and traffic flow management around large-scale facilities	3) Institutional arrangement
	(j) Land acquisition for public facilities	Indonesia/ Makassar City	Proposal on alternative methods for land acquisition (right conversion, etc.), formulation of standards and methods for compensation	3) capacity development (advisory)
	(k) Solid waste management	Makassar Port Authority	Capacity development to realize comprehensive solid waste management Environmental education for 3R	3) capacity development
	(r) Human resource development of port authorities	Makassar Port authority	Establishment and capacity development of port authority	3) capacity development
	(k) Port development strategy by phase	Makassar Port Authority/ PELINDO IV	Development of comprehensive port development strategy based on Yokohama Port's experiences	1) Policy and planning

Source: JICA Study Team

(4) Possibility of Assistance by JICA

4.57 As for deployment of city-to-city international cooperation and business relations is found not only in Yokohama case, but the similar activities are conducted by other local governments like Kita Kyushu city, Osaka city, Kobe city, Hyogo Prefecture, and Saitama Prefecture which have concluded comprehensive alliance agreement with JICA. Beside some of the precedent cities, local governments are seeking for concrete actions. The establishment of the above mentioned full scale cooperative relation is by far challenging for local governments when they conduct actions by themselves alone due to lack of information, know-how, fund, and human resources; particularly for those with less experience. City-to-city alliance is the one among local governments and it is characterized that close human network, information exchange can enable it to respond to urban problems and make use of knowledge quickly. Different from the assistance between national governments, it is featured that the system can handle problems which need a comprehensive and careful consideration by the local governments from the viewpoint of urban management and environmental improvement of citizens' life. It is thought effective to promote "city-to-city cooperation" by making best use of information of cities in the world, know-how on bilateral cooperation and ODA finance that JICA owns, and human resources of JICA and consultants working with JICA. Specifically, the following measures are proposed.

4.58 **Utilizing of existing schemes:** There are a variety of project schemes that local governments and SMEs can take part in: such as Assistance for SMEs by Ministry of Foreign Affairs/JICA, JICA's grass-root technical cooperation project (regional proposed type), PPP infrastructure project, and recently, large scale project formation study of Joint Crediting Mechanism (JCM) by Ministry of Environment. In order to make use of these schemes, it should be advanced to integrate information of projects in which local governments and SMEs take part, and to review experience and know-how like a project research, and to provide the information to those local governments that are keen to city-to-city cooperation.

4.59 **Involvement as advisor to urban development and infrastructure projects:** For urban development and infrastructure projects that JICA implement, in the part of urban management from making a master plan to individual project implementation, it is encouraged that local governments in Japan which has actual experience and know-how get involved in the projects. Specifically, they are involvement as member of the assistance or advisory committee held in Japan, participation as advisor, dispatch as short-term experts, lecturer at seminars and workshops held in the project country, acceptance of counterpart training, and so on. These activities is expected provide a balanced assistance to meet the needs of the project cities, including creation of the chance to establish the city-to-city cooperation, making use of human resources of local governments that hold experts in various urban problems; thereby lead to improvement of JICA's presence to the project cities and facilitation of the bilateral cooperation.

4.60 **Accumulation of know-how and establishment and promotion assistance of cooperative system**: Presently the inter-local governmental and city alliance/cooperation is limited to some large cities and those cities with sister-city relations with cities overseas. Many local governments have recently started deploying oversea business operation of Japanese local companies through the city-to-city alliance and civic alliance; and accordingly they have not established approach and know-how sufficiently

yet. Therefore, in the short-run, it is required to accumulate knowledge of oversea deployment and human resource networks by coordinating closely with JICA projects, establishing oversea information and network of local governments, and utilizing the programs and grass-root technical cooperation projects that JICA presently conducts, MOF's SMEs assistance project scheme. Strengthening of support function of city-to-city alliance/cooperation in JICA and in the mid- to long-term, establishment of "Urban Solution Center (tentative)" with the initiative of universities and research institutes, it, through cooperation of JICA and specialized institutions, is expected to promote effectively accumulation of know-how and city-to-city alliance/cooperation with overseas cities. The center also can provide the best solution package for the cities overseas by grasping the know-how of Japanese local governments which are keen for city-to-city alliance/cooperation with cities overseas, and solutions to urban problem of the private companies. Furthermore, the accumulated urban know-how can be delivered effectively to key persons of cities in developing countries by utilizing show rooms and training programs of the accumulated know-how of the local governments.

5 Conclusion and Recommendations

(1) Conclusion

1) Lessons Learned from Yokohama City to realize sustainable urban development tackling with urban problems

5.1 It is said that 21st century is “the era of the city”, which means that cities support the growth of countries and regions, and the performance of the city affects countries and regions. With the rapid growth of the economy, motorization and population concentration in urban areas has progressed vigorously, various urban problems have erupted in emerging countries.

5.2 Sustainable urban development is a common objective for both developed countries and emerging countries. Sustainable development can be realized if sustainability of economic, social and environment is kept at the same time. Essences of sustainable urban development and management of Yokohama City are summarized as follows:

5.3 **Strategic and comprehensive approach:** In order to overcome the urban challenges Yokohama occurs in each period and to promote sustainable urban development, the approach which Yokohama took is "holistic and participatory". The infrastructure development often becomes a stack of projects of department concerned, if each project and department is not well coordinated. In case of Yokohama which is obvious in the experiences of 6 major projects, synergic effects of the whole city can be produced if contents of projects, schedule, implementation bodies are well coordinated and harmonized. For example, "residential development in Kohoku NT - improving access by subway development - job creation in MM21" is one of examples which realized large-scale urban development projects integrated with an urban transport project. Furthermore, these integrated projects can avoid overinvestments.

5.4 Thus, it can be to examine the interaction of various projects to achieve business promotion strategically by determining priorities, so a comprehensive urban development has been realized in a sustainable manner. For this, it is indispensable to discuss strategic projects from the planning stage, clarification of roles and responsibilities of each organization with coordination functions.

5.5 **Leadership of municipality:** according to the changing times, Yokohama has the experience to promote policies and urban development projects while moving citizens, private sectors and central governments. Even city leaders replaced, urban infrastructure development projects have continuously promoted in the long-term with strong leadership, support of citizens and the city council. It has been promoting at the same time to control the urban development on the basis of the rules of their own "control and guidance", in parallel with implementation of integrated strategic "projects". This concept has been handed down while changing the shape, leverages the power of the private sector and citizens as implementation bodies, and with the power of government as a facilitator. Know-hows accumulated in the process of urbanization in Yokohama are many and can be shared with these emerging cities.

5.6 **Comprehensive approach towards the master plan implementation:** In the high-growth period when Yokohama were confronted with urban issues, the City was busy in infrastructure development to meet with demand of rapid population growth. For public investment, in addition to their own budgets, the City requested private sector to develop burdens, and utilized subsidies and bonds of international and central governments. As a

result, the City could focus to invest necessary public services, and strived to improve the citizen's life. To implement projects in compliance with the master plan, the City has worked comprehensive mutual cooperation and prioritization of projects, formulation of implementation scenario, funding, institutional arrangements, and human resource development, and these efforts have led the city to overcome challenges, to realize a sustainable urban development.

5.7 **Role as a facilitator:** In the past time when the concept of public participation was not established, Yokohama City took an initiative of projects with public participation such as 10,000 citizens meetings with the mayor, Kohoku New Town Development Council, the G30 of solid waste collection system with citizens and companies, etc. Thanks to these challenges the City has accumulated know-how and experiences of public participation. Recently, the City call for advanced challenging companies in the city which have motivations and new ideas to work together for YSCP (Yokohama Smart City Project) and Y-PORT for international technical cooperation. For this, Yokohama City facilitates citizens and private sectors with providing participation opportunities (employment, residential, environmental improvement, cultural activities, etc.) and opportunities of experimental study. It can be said that such efforts have generated feeling of commitment to Yokohama City as well as relationship of trust among city government, private sector, and citizens.

2) Issues of Technical Cooperation by Japanese Municipalities

5.8 This study revealed that that know-how and experience of urban development in Japan is useful for developing countries cities can be confirmed, constraint on the organizational and administrative systems as also became clear. In each municipality, and create an environment in which there is a position as part of the policy of the municipality of international technical cooperation, local city government can perform international technical cooperation, the provision of participation opportunities to promote understanding of public companies and private level is required.

5.9 **Expectation gap awareness and city-to-city cooperation:** One of major objectives of assistances from local governments in Japan to cities in developing countries is to promote business opportunities for private sectors including small and medium-scale enterprises. On the other hand, developing cities and JICA often expect Japanese municipalities to provide for human resource development and institutional development which the local government has accumulated know-how and experiences. Conflicts and gaps among beneficiary (developing cities) and assistant providers (Japanese cities) sometimes become obvious. For effective implementation of city-to-city cooperation, it is necessary to identify needs and inputs of both sides from the beginning. If the inputs from Japanese cities and/or private sectors won't meet with needs from developing cities, it is necessary to coordinate with JICA and other cities in Japan in a flexible manner.

5.10 **Lack of information and different custom of developing cities:** Through the mechanism of city-to-city cooperation, such as CITYNET and Y-PORT project, City of Yokohama disseminates the information in developing countries and cities. Thanks to these efforts, private sectors in the city have been interested in doing business for developing cities, and have applied for schemes such as SME promotion projects and PPP FS study of JICA. While business opportunities of developing cities have been increased thanks to economic development, there are difficulties for business promotion and investments such as lack of information, human resource network, risk management, different business customs, lack of institutional system, small scale of local business, etc. It

is obvious that business matching events are often ad-hoc which cannot generate actual business opportunities for both cities, since it is difficult to apply for Japanese technologies and facilities to developing cities which there are gaps of local condition, needs, capacities of finance and human resources.

5.11 **Difficulty of participation in technical cooperation projects by local governments:** The main tasks and responsibilities of civil officers of municipality is to fulfill their duties for citizens of the city. It is required to clarify significances and benefits of international cooperation for their own city. So it is basically difficult for local government officers to support developing city government directly to work with them for human resource development and technical cooperation. In addition, because since it is accumulated in the high-growth period of 1960 -80's, many of the experiences that contribute to the urban problem solving, many of the personnel who worked in the position of the government at that time directly has retired from active duty, so these technology transfer by government officials that have experienced initiatives is difficult. For this reason, it is necessary to establish an institutional framework to promote international cooperation by local governments, such dispatch of retired local officers, conduct domestic training courses by inviting officers and engineers of developing cities to Japanese cities, conduct OJT for them in a certain period of time, etc.

5.12 **Difficulties of internal coordination among departments of municipality:** In local government, assumed fields, expertise and expectations for development cooperation are different, it is difficult to make a consensus among departments. While local governments have efforts and experiences in the specific sector of environment and water supply and sewerage, etc. it is difficult to promote technical cooperation of comprehensive urban development sector. For this, multi-sector approach and coordination are indispensable. For example, City of Yokohama organizes “Team Yokohama” composing officers from various departments to provide technical advices and supports to Bangkok of Thailand. With experiences of establishment of “Project Coordination Division” when Yokohama City implemented 6 major projects as a coordination body, it is expected internal coordination among departments and organizations for international technical cooperation.

3) Significance, Limitation and Potentials of Promotion Tools

5.13 Knowing the experience of local governments that have overcome the challenges associated with the growth of the city is a valuable opportunity for developing countries city but, pamphlets and video that summarizes them, compact and overall, a wealth of experience and a long history it is an effective tool to tell. For urban problem solving in developing countries, what kind of approach, what better outcome or was obtained, be to presentation through photos and video, image of the solution of urban problems in common, similar to Yokohama it was possible as well to build, resulting in confidence and closeness to the city. Further, since to introduce the efforts of business for specific project profiles, it was possible to increase the interest in the business and various measures, and to provide materials to examine the applicability of the cities themselves.

5.14 In the pamphlet of Yokohama’s urban development, 7 major approaches were summarized which developing cities have faced related issues as well as Yokohama City will be able to provide know-how. On the other hand, since the problems and socio-economic situation of developing countries and cities are different, these know-hows cannot be applied directly. Therefore, with the help of these promotion tools, cities and

their experiences and know-how of urban development in Japan are shared to developing cities, and these tools will lead to discuss and share urban issues and needs among stakeholders.

5.15 It is expected that these promotion tools will be utilized at seminar, workshops, training, etc. which City of Yokohama and JICA organize. In addition, after using these tools, it is necessary to discuss with issues and expectations from developing cities, and follow up necessary technical cooperation from Yokohama and JICA, such as periodical seminars and trainings, implementation of projects which Yokohama or other cities will participate in.

4) Potentials of international cooperation and business promotion between cities

5.16 This study revealed that local authorities of developing countries who wanted to learn the know-how and experience how local governments of Japan, including Yokohama overcome urban problems and what local governments handled them, and not limited to investment promotion and business development of the private sector. The experience of urban development of cities in Japan that such as soft power corresponding to the urban problems that developing countries cities are facing, it is very useful has been revealed. To match the overseas expansion of hard surface such as infrastructure development and high technology in Japan, the needs of technology transfer and human resource development policy and institutional building such as this is very high, that can be shared experience along the challenges of developing countries city I said that Japanese local governments of many to have, and know-how.

5.17 What is important to utilize the promotion tools of Yokohama is that developing cities try to turn Yokohama's know-how into practical use to promote urban development of their own cities. Japanese local government officers who work for urban management and civil service daily can provide applicable advice of all planning processes including reviewing existing plans and information, issue analysis, visioning and strategies, implementation program formulation, etc. Mutual understanding and sharing of these processes will strengthen relationship of trust between cities.

5.18 Through efforts of cities with participation of JICA projects, some cities have promoted city-to-city cooperation, such as Yokohama City - Cebu City and Da Nang City, Kitakhusyu City – Surabaya City, Osaka City – Ho Chi Minh City, Asahikawa City – Ulaanbaatar City, etc. As JICA experts or advisors of projects, local government officers of Japanese City will be able to provide advice on capacity development for urban planning and development by communicating each other. Furthermore, they will be able to contribute to human resource and organizational development, promotion of business activities and people's exchange, as facilitators between cities.. Self-help efforts by local governments is essential for this reason, it is necessary that it is possible to understand the needs of the partner cities through such international exchange and training accepted from developing cities, and strive to enlightenment and understanding of the public for international cooperation.

5.19 Business promotion by private sectors have also expanded, but most of them are limited to the provision of equipment and transfer of technology possessed by the company, and it did not result in the transfer of know-how of comprehensive urban development. Pilot projects and feasibility studies with the help of the scheme of JICA, Ministry of Land, Infrastructure and Transport, Ministry of Economy, Trade and Industry, Ministry of the Environment, etc. of Japan have been implemented for both technical transfer and

business promotion. It is required to reflect these efforts and know-how into policies and plans of developing cities which Japanese private sectors easily promote their activities supported by public sectors.

(2) Recommendations

1) Technical Cooperation in response to needs of city and level of development

5.20 In the international technical cooperation and city-to-city cooperation in the future, in the "policy and planning level", from the stage for determining the direction of the city, to promote the participation of stakeholders, and to build a shared vision is important, there know-how of facilitator of local government in Japan can take advantage of.

5.21 In the project level, in accordance with the ODA projects, public-private partnership will be realized with support from local government such as project implementation methods, financing, institution-building, and support from private sectors such as introduction of advanced technology and basic infrastructure development know-how. In case of new urban area development such as new town, commercial and business district, industrial zone, it will be a good opportunity to apply for comprehensive urban development methods with new environment technologies for realization of a smart city development as a model.

5.22 And one of the most important know-how which can be shared is "cooperation and coordination with stakeholders such as citizen". In addition to physical and technical constraints, developing cities have faced institutional arrangements such as information declaration, public participation, land acquisition, environmental and social consideration, etc. Local governments of Japanese cities will be able to provide necessary tasks and know-how to deal with these issues based on existing legal system, or with proposed systems.

5.23 Necessary solutions differ according to the stage of development of the city in different cities of the legal system and socio-economic situation. Therefore, to provide the necessary know-how and technology, it is important not only the challenges that developing cities are facing now, but also analysis and development potential challenges and will face the future, from the perspective of urban management and long-term comprehensive and sustainable development of developing cities.

2) Establishment of Platform for City to City Collaboration

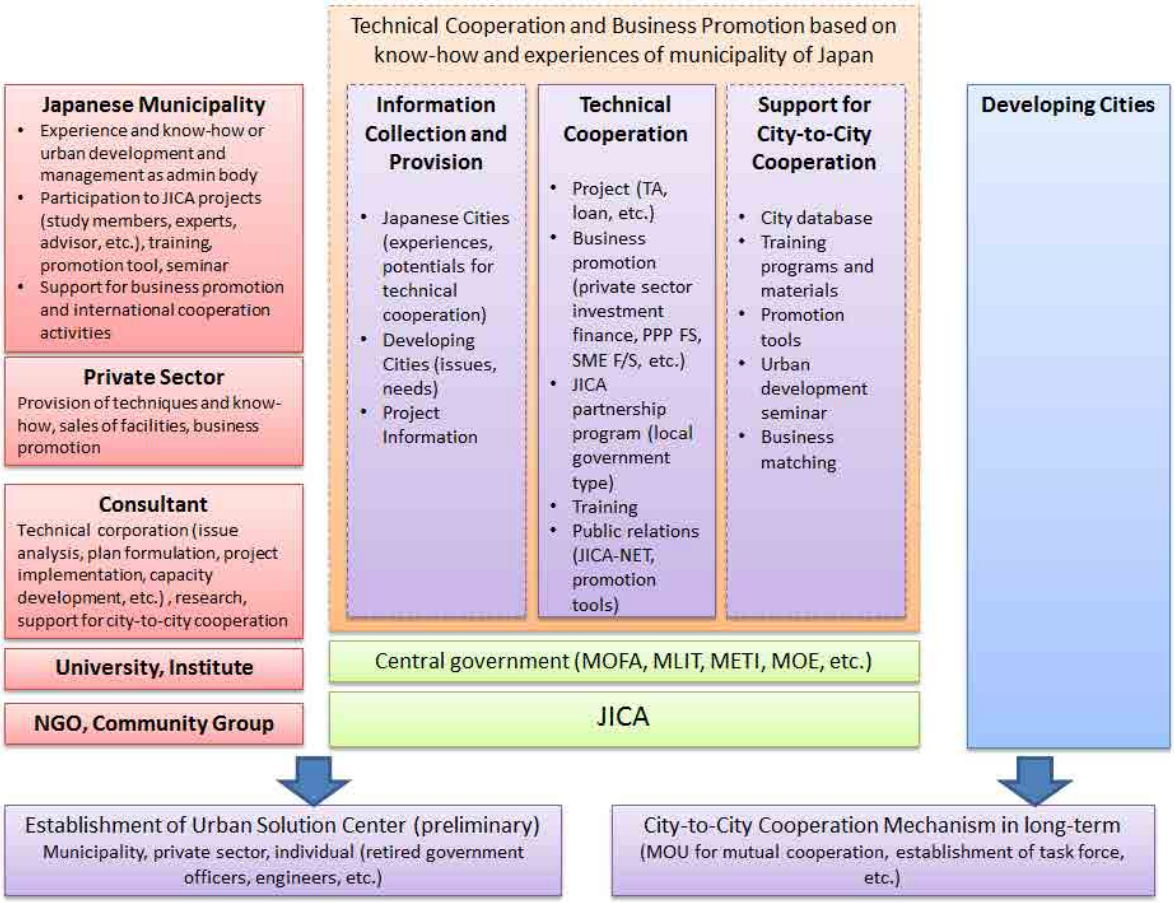
5.24 Yokohama City has entered into a memorandum of technical cooperation agreement between the two countries Cebu City, Da Nang City, and the like Bangkok Metropolitan far , in order to lead to projects and specific actions this , constraints having the municipality and taking into account (the difficulty of raising human resources , lack of funds , etc.) , making framework for the efforts of urban long-term development is required. In small and medium-sized cities in developing countries, from the fact that rapid economic growth and population growth is expected future , the application of the know-how and experience of urban development in Japan is expected in particular . For this reason, it is possible to build in order to carry out medium-and long-term monitoring and discussion for problem-solving needs and excavation of the city, (Task Force, such as the Council) the platform in both cities is desirable . In this platform, and private companies in both cities, JICA, recipient governments , interested to participate . Until now has played JICA played a central role , needs and excavation urban issues , and monitoring project formed, but that the local government of Japan to support this, from the point of view of urban

management , solution of a variety of urban challenges finding the is expected .

3) Overall Framework of Collaboration among Cities

5.25 While leveraging the budget of the local government and its own central government and JICA, Japanese local governments, including the City of Yokohama, has been promoting the business development of the private sector and international technical cooperation so far. By to be shared by local governments across Japan and initiatives know-how of these, by knowing the applicable experience and technology needs and developing countries city, it is possible to sell the know-how of urban development as the All Japan.

Figure 5.1 Overall Framework for City-to-City Cooperation



Source: JICA Study Team

4) Achievements and Next Steps

5.26 The study, developing countries to model the Yokohama have overcome the urban variety of problems at a time of rapid population growth and economic growth, analyze the experience and know-how of its urban development, currently, are faced with urban issues similar by (Da Nang city, Jakarta special Province, model the Makassar city) a better match between the needs and challenges of the city , proposals and initiatives of urban development in the future are proposed. As a result, for the Japanese local governments, including the City of Yokohama, as well as contribute to the business creating opportunities to the private sector and potential international cooperation, for developing cities, and local governments of Japan, it could be shown that it is useful as a partner for business

development and technical support in the future. Technical cooperation of the city-to-city level are made to a particular business so far, advanced cases of city-to-city cooperation of Yokohama and comprehensive analysis of the entire city, that it has made a proposal for technical cooperation possibilities between cities is an epoch-making , use of developing countries in both urban and local governments of Japan is expected .

5.27 While leveraging the budget of the local government and its own central government and JICA, Japanese local governments, including the City of Yokohama, have promoted the business development of the private sector and international technical cooperation so far. By sharing local governments across Japan and initiatives know-how, by knowing the applicable experience and technology needs and developing countries city, it is possible to sell the know-how of urban development as the All Japan.

5.28 Leveraging support scheme existing in the short term, is not limited to technical cooperation projects with consultants, advisors and participation by local governments, such as through pilot projects of business development of the private sector, it is an opportunity of business development and sharing of know-how of local government. In the medium to long term, establishment of an independent body is expected to participate in the human resources, proposed in Chapter 4 "Urban Solution Center".