ISAP2013

Creating Showroom of the Green City in Surabaya by Intercity Cooperation

Kitakyushu Asian Center for Low Carbon Society

Kitakyushu Asian Center for Low Carbon Society opened in June 2010.

Utilization of the environmental technologies developed through the solution of pollution problems and manufacturing processes, and the inter-city network established by international cooperation in the past

Accumulating environmental technologies in Kitakyushu City and throughout Japan, for building low carbon societies in Asia through environmental business skills

Aims of the Center

Needs of newly developing countries:
Constructing green cities, not only transferring technologies

Total power as a leading runner of an environment-friendly city (Kitakyushu City)

Experience with overcoming pollution problems + **Advanced social system (Kitakyushu Eco-Town, etc.)** + **Excellent environmental technologies**

Responding to diversified needs of Asian cities and companies
Ex.: Eco-Cities and Smart Cities

Custom-made
Export of green cities

Greenhouse gas reduction
Bilateral credits

Establishing a base Asian region
for demonstration experiments and human resource development

Base for environmental business in the Asian region

Priority fields in technological transfer

Energy management

Regional management of energy by placing city and regional electricity plants at the core

Yahata Higashida District, where an environmentally conscious town is under construction

Kitakyushu Smart Community

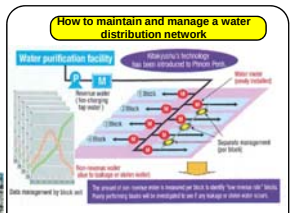
Water business

Water recycling demonstration plant combining sewage water membrane treatment and seawater desalination

Water Plaza

Water created from sewage: 1,000 m³/day
Water created from seawater: 400 m³/day

(Hiakari Sewage Treatment Plant)



Non-revenue water rate is improved.
72% (1993) → 8% (2006)

Cooperation between government and the private sector
Transferring
a package on environmental technologies and social systems

Recycling and waste treatment

Kitakyushu Eco-Town

Home appliance recycling

Bicycle recycling

Economic effects (25 projects):
* Direct investment: approx. 60 billion yen
* Generated employment: approx. 1,300 jobs
CO_2 reduction: approx. 200,000 tons/year

Most advanced facilities for waste treatment
Shaft-gasification furnace

Shin-Moji Plant
Safe facilities that achieved recycling of waste and effective utilization of heat energy

Cleaner production and prevention of pollution

Introduction of cleaner production (CP)

* Evaluation and improvement of raw material and fuel use
* Improvement of manufacturing processes
* Thorough implementation of maintenance and management
* Human resources development, etc.

→ Achievement of energy saving and resource saving
Reduction of environmental loads
+ Higher productivity

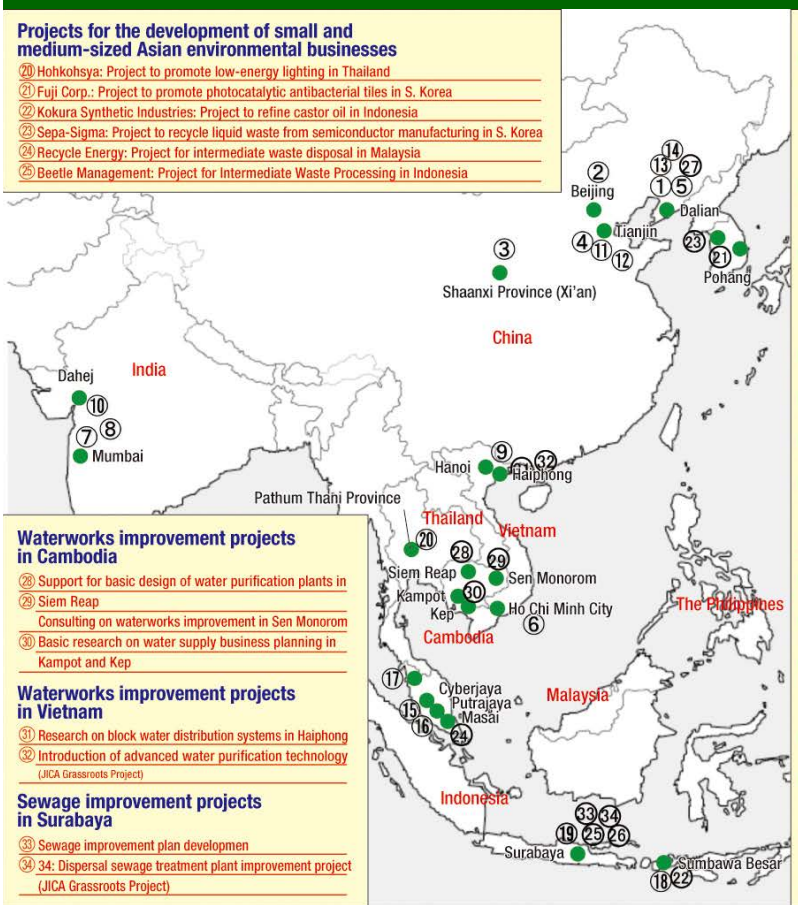
End-of-Pipe (EOP) measures

Electric dust collector | Flue-gas desulfurization facilities | Waste water treatment facilities

New development strategies in Japan

One of the 21 national strategic projects
Developments in Asia
(Overseas development of packaged infrastructures)
Market scale: 19,700 billion yen (Target to achieve by 2020)

Diverse Project Development Map



Projects for the development of small and medium-sized Asian environmental businesses

⑳ Hohkohsya: Project to promote low-energy lighting in Thailand
㉑ Fuji Corp.: Project to promote photocatalytic antibacterial tiles in S. Korea
㉒ Kokura Synthetic Industries: Project to refine castor oil in Indonesia
㉓ Sepa-Sigma: Project to recycle liquid waste from semiconductor manufacturing in S. Korea
㉔ Recycle Energy: Project for intermediate waste disposal in Malaysia
㉕ Beetle Management: Project for Intermediate Waste Processing in Indonesia

Waterworks improvement projects in Cambodia

㉘ Support for basic design of water purification plants in Siem Reap
㉙ Consulting on waterworks improvement in Sen Monorom
㉚ Basic research on water supply business planning in Kampot and Kep

Waterworks improvement projects in Vietnam

㉛ Research on block water distribution systems in Haiphong
㉜ Introduction of advanced water purification technology (JICA Grassroots Project)

Sewage improvement projects in Surabaya

㉝ Sewage improvement plan developmen
㉞ 34: Dispersal sewage treatment plant improvement project (JICA Grassroots Project)

Feasibility studies and commercialization

①～④ Yaskawa Electric Corporation: Energy conservation projects
① JETRO (2008, Dalian)
② Ministry of Economy, Trade and Industry (2010, Beijing)
③ Ministry of the Environment (2011, Dalian)
④ Sixth Japan-China Energy Conservation and Environmental Forum Cooperation Project (2012, Tianjin)

⑤、⑥ Toto Ltd.: Projects to promote low-energy home appliances
⑤ Ministry of the Environment (2011, Dalian)
⑥ Ministry of Economy, Trade and Industry (2012, Ho Chi Minh City & Hanoi)

⑦～⑨ Nippon Magnetic Dressing: Projects for recycling discarded electrical appliances
⑦ Ministry of Economy, Trade and Industry (2012, Mumbai)
⑧ NEDO demonstrations (2012, Mumbai)
⑨ Ministry of Economy, Trade and Industry (2012, Hanoi, Ho Chi Minh City, & Haiphong)

⑩ Hitachi and others: Dahej Eco-city Development Support
- Ministry of Economy, Trade and Industry (2010–, Dahej Zone, India)

⑪ Eco-Material Corporation: Project for recycling waste plastics
- Ministry of the Environment (June 2011–, Tianjin)

⑫ Kyushu Metal Industry: Project for recycling used automobiles
- Ministry of Economy, Trade and Industry (Dec. 2012–, Tianjin)

⑬ Project for cooperation and advancement of recycling-oriented cities through a Kitakyushu-Dalian partnership
- Ministry of Economy, Trade and Industry (2009–2011, Dalian)

⑭ Matsumoto Mitsuharu Shoten: Project for building a used paper recycling system
- Ministry of Economy, Trade and Industry (Oct. 2012–, Dalian)

⑮ The Japan Research Institute, Limited: Building environmentally friendly cities in Malaysia
- NEDO (2011, Putrajaya & Saiba Jaya)

⑯ The Japan Research Institute, Limited: BEMS Aggregation Project
- Ministry of Economy, Trade and Industry (Dec. 2012–, Putrajaya)

⑰ Shinryo Corporation: Project for total recycling in electronic manufacturing processes in Malaysia
- Ministry of the Environment (May 2012–, all of Malaysia)

⑱ Toray Group: Indonesia BoP Project
- JICA (Nov. 2011–, Sumbawa Regency and elsewhere)

⑲ Nippon Steel Engineering and others: Energy conservation and cogeneration project in Indonesian industrial zones
- Ministry of Economy, Trade and Industry (Mar. 2012–, Surabaya)

㉖ Nishihara Corporation: Pilot project for intermediate waste disposal and recycling facilities
- Ministry of Foreign Affairs (Dec. 2012–, Surabaya)

㉗ Nippon Steel Chemical: Licensing of nitrate nitrogen removal technology

International Environmental Cooperation in Surabaya

Waste management in Surabaya, Indonesia's 2nd largest city, started from 2004

Koji Takakura of JPEC teaching about the composting technique

Spread of organic waste composting techniques from Kitakyushu to over 20,000 households in Surabaya

30% reduction of waste

City in 2001
Streets overrun by garbage

Surabaya's streets today
Increased greenery in parks and along roads using compost

Partnership between Surabaya and Kitakyushu

A joint statement was made in March 2011 on a strategic environmental partnership between Surabaya and Kitakyushu.

“Green Sister City” agreement was signed in November 2012 between Surabaya and Kitakyushu.

Exporting Green Cities (A Case Study from Surabaya)

Waste disposal

Surabaya has requested assistance for waste disposal project development. Additionally, Nishihara Corporation is looking into operations related to improving the livelihoods of waste recyclers and waste pickers. (Overseas development support for smaller businesses, utilizing the Ministry of Foreign Affairs and the ODA)

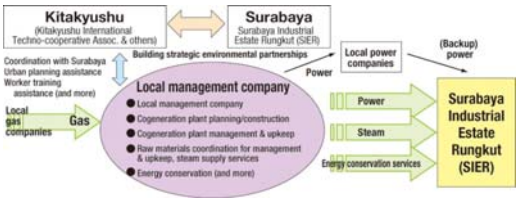
Wastewater treatment (river cleanup)

A master plan related to wastewater management for the Kali Mas river, with a focus on the Gundy area, is being developed, basic dispersal wastewater treatment is being expanded under the management of model community residents, and an operation for constructing and managing medium-sized treatment facilities is underway.
(JICA Grassroots Cooperation Project)

Project for cogeneration (steam + electricity) & energy conservation

Surabaya Industrial Estate Rungkut (SIER)

Export of technology and knowledge from Yahata Higashida Smart Community project



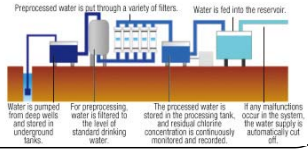
Ministry of Economy, Trade and Industry: “Infrastructure and Systems Export Promotion Research Project”

Investigating methods for quantifying CO_2 reduction

As for operations being conducted in Surabaya, methods for quantifying reducible volumes of CO_2 are being investigated. (IGES)

Tap-water purification

Ishikawa Engineering Corporation, which successfully implemented well-water purification systems, is currently looking into operations involving the installation of water supply equipment in the community that could purify tap-water (though not drinkable) And provide safe, reliable water.



Drinking water supply operations through solar power and small desalinization/water purification equipment

In areas that do not yet have electrical and waterworks infrastructure, Toray Industries, Inc. and Suido Kiko Kaisha, Ltd. will be using solar panels and water purification equipment (reverse osmosis filters) with desalinization capabilities to provide inexpensive clean drinking water. Installation and maintenance centers for drinking water supply equipment will be built in Surabaya.
(JICA BoP project)

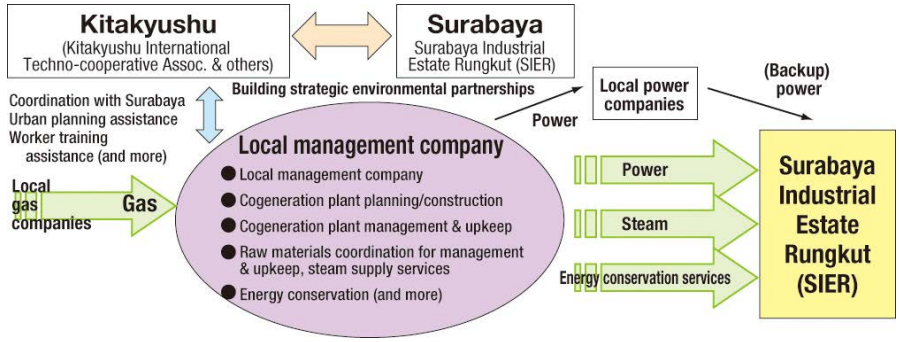
Project for Cogeneration and Energy Conservation at Surabaya Industrial Estate, Indonesia

Nippon Steel & Sumikin Engineering Co., Ltd., Fuji Electric Co., Ltd., & NTT Data Institute

Ministry of Economy, Trade and Industry: "Infrastructure and Systems Export Promotion Research Project (Feasibility Study on Smart Community Projects in Global Markets)" (Mar. 2012–) (19)

- Master plan development related to advancements in the environment and energy (for the Surabaya Industrial Estate Rungkut [SIER])
- Export of technology and knowledge from Yahata Higashida Smart Community project
- Feasibility of establishing a local management company to offer the following energy and energy conservation services.
  - A cogeneration operation to provide high-quality, efficient power and steam
  - Energy maintenance services for industrial estate factories to provide steam systems and energy-conserving systems
  - Development of an advanced sewage and waste treatment service centered around the industrial estate

Surabaya Industrial Estate Rungkut (SIER)



*The Surabaya Industrial Estate Rungkut (SIER) The SIER, which was established with 50% investment from the Indonesian gov't, 25% from State of East Java, and 25% from the City of Surabaya, is an industrial estate some 300 ha in size, and home to about 300 companies.

We hope for this to be our first overseas export from the Kitakyushu Smart Community Creation Project. We intend to develop a successful model in Surabaya and spread it to other parts of Asia with the same issues (insufficient power or low-quality power).

Pilot Project for Establishing Recycling-Oriented Intermediate Waste Processing Facilities in Surabaya

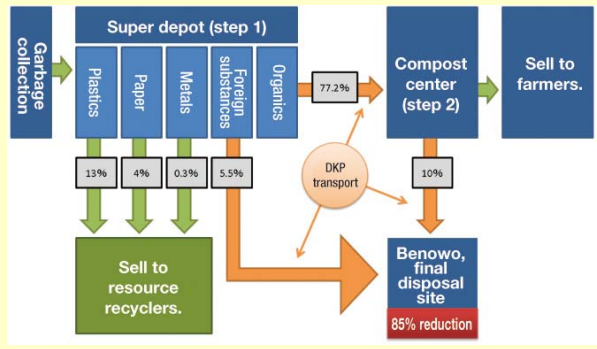
Nishihara Corporation

Ministry of Foreign Affairs: "Project to Increase Adoption at Governments of Developing Countries through Government Development Assistance and Foreign Economic Cooperation Business Costs" (Dec. 2012–) (26)

This business model involves the collection of general garbage collected in cities, sorting and processing it in accordance with recycling demand, and selling it through continuous establishment of local "recycling-oriented intermediate valuable and organic waste processing facilities with wholesaling capabilities" and the development of such sites as "super depots."
We examine operations for intermediate processing of waste in cooperation with waste-pickers who collect valuable items, such as plastics and metals, from waste under poor work conditions, and for the sale of valuable materials and compost.

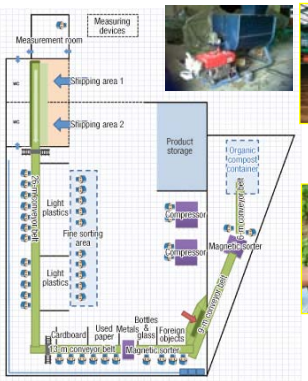
Assuming approx. 1,200 tonnes/day:

Items	Items	1 Day	Per Month
Organics	77.2	923.4t	28,163t
Plastics	13	156t	4,742t
Paper	4	48t	1,459t
Metals	0.3	3.6t	109t
Other	5.5	66t	2,006t



We are examining future business plans that include up to 10% of foreign matter containing selected organic materials. Nevertheless, the amount of material finally disposed of in landfills can be reduced about 85%.

Super depot (step 1)



Composting center (step 2)

Composting center facilities (daily volume of 100 t)

The compost proceed is used for experimental crop production. (Trawas: 400 m²)

Sewage Improvement Projects in Surabaya

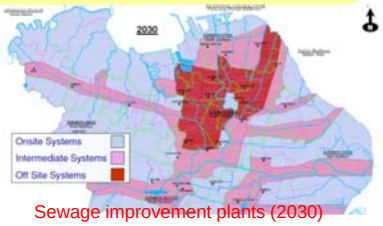
Original Engineering Consultants Co., Ltd. & the Kitakyushu City Water and Sewer Bureau

Ministry of Land, Infrastructure, Transport and Tourism: "Development of Sewage Improvement Plans in Indonesia's Metropolitan Areas" (Dec. 2012–) (33)

Development of Sewage Improvement Plans

Surabaya, Indonesia's second-largest city with some 30 million people

- Efficient sewage improvement methods applicable to Surabaya's track record
- Items required for appropriate management of sewage operations
- Methods of educating the public for facilitating sewage operation management
- Utilizing the participation and technology of Japanese firms …and more



Sewage improvement plants (2030)

Problems faced by Surabaya

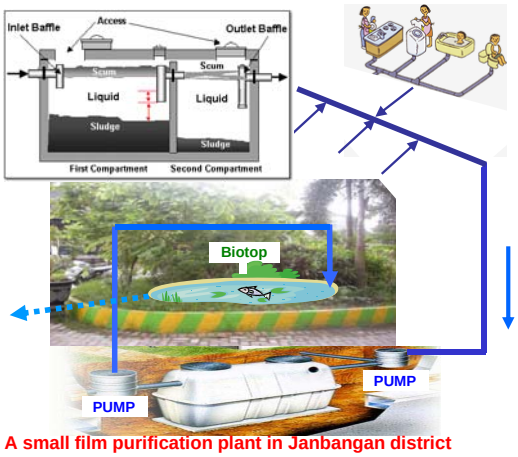
1. The city has no sewage system, so domestic sewage is simply discharged from septic tanks into rivers with only basic treatment, or discharged directly untreated.
2. Garbage is illegally dumped in rivers and canals.
3. The city is affected by inflows of industrial sewage.
4. The entire city is located in a plain, with very little water flow in canals, so water stagnates and becomes polluted easily.
5. Rivers follow gentle slopes are not swift-moving, so sediment accumulates easily.

A JICA Grassroots Cooperation Project

Dispersion sewage treatment plant improvement project (34)

Kitakyushu is taking advantage of a JICA Grassroots Cooperation Project (FY2011–2013) and is in the process of creating a master plan covering the following facilities as a project for improving dispersal sewage treatment facilities:

- A small film purification plant in Janbangan district
- A river purification plant in Tenggilis district
- A fish market sewage treatment plant in Pabean district



A small film purification plant in Janbangan district

Indonesia BoP Project

Toray Group (Suido Kiko Kaisha, Ltd. & Toray Industries, Inc.)

JICA: "Study on Arrangements for Promoting Cooperation with BoP Businesses" (Nov. 2011–) (18)

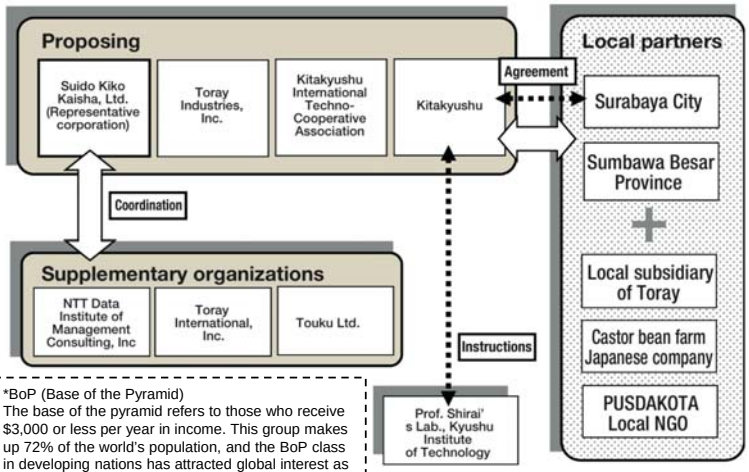
Installation of PVRO at a hospital on Sumbawa

Installation of small solar-powered desalinization machine (PVRO)

In the island region of East Java province, where electrical and water infrastructure are undeveloped, we plan to utilize solar-powered, hybrid water purification equipment with desalinization capabilities to conduct a study on introducing systems that can cheaply supply clean drinking water and improve the local living environment.

The Kitakyushu Asian Center for Low Carbon Society is in charge of the community development and business hub development that will play a key role in creating business models, as well as coordinating with the government of Surabaya.

Our aim in conducting this study is to create new public-private partnerships in emerging nations from a perspective that emphasizes the construction of low-cost business models and the development of technologies appropriate to local needs while protecting local culture.



*BoP (Base of the Pyramid)
The base of the pyramid refers to those who receive $3,000 or less per year in income. This group makes up 72% of the world's population, and the BoP class in developing nations has attracted global interest as a new market.

Issue of Sectoral Master Plan

Various sectoral master plans (regional development, railway construction, sewerage and etc.) are planned by Japanese government, JICA and international cooperation organization of Australia.

1. These master plans were prepared by East-Java state government as a contact window and Surabaya city as an operation site, however, Surabaya city government is not so much involved with the plans.

Accordingly, for example, voluntary involvement of Surabaya city in the master plan of wastewater prepared by International Development Agency of Australia is not so much expected as following reasons;

*** Procurement of a vast land necessary for the proposed sewerage disposal system is difficult.**

*** No specific proposal is proposed regarding construction of sewerage pipeline in the congested streets and roads.**

2. Preparation of master plan of waste management is the number 1 priority of Surabaya city (mayor, city planning department. beautification department and etc.)

Master plan of waste management in Surabaya city is to be prepared by a technical cooperation project with JICA from 2013, however, the city has already promoted the waste management, so, Barik-Papan and Paren-Ban became a target for the master plan.

3. Aim of Surabaya city is a unique “Green City” in Indonesia by cross-sectoral linkage with these master plans.

* Human resources of Surabaya city is not enough to realize the “Green City”, so capacity-building program is necessary for the employees of Surabaya city.

Issue of Individual Project

Various projects are developed in Surabaya city in cooperation with Kitakyushu city, such as waste treatment, drainage treatment, purification of tap water and well water, to make industrial zone smart.

1. Though various sectoral projects are in development, cross-sectoral cooperation is not enough for the concept of the Green City.

* Various projects are conducted individually in accordance with the needs of Surabaya city, however, each project is not linked organically each other because integration of every project does not exist in the upper town management plan.

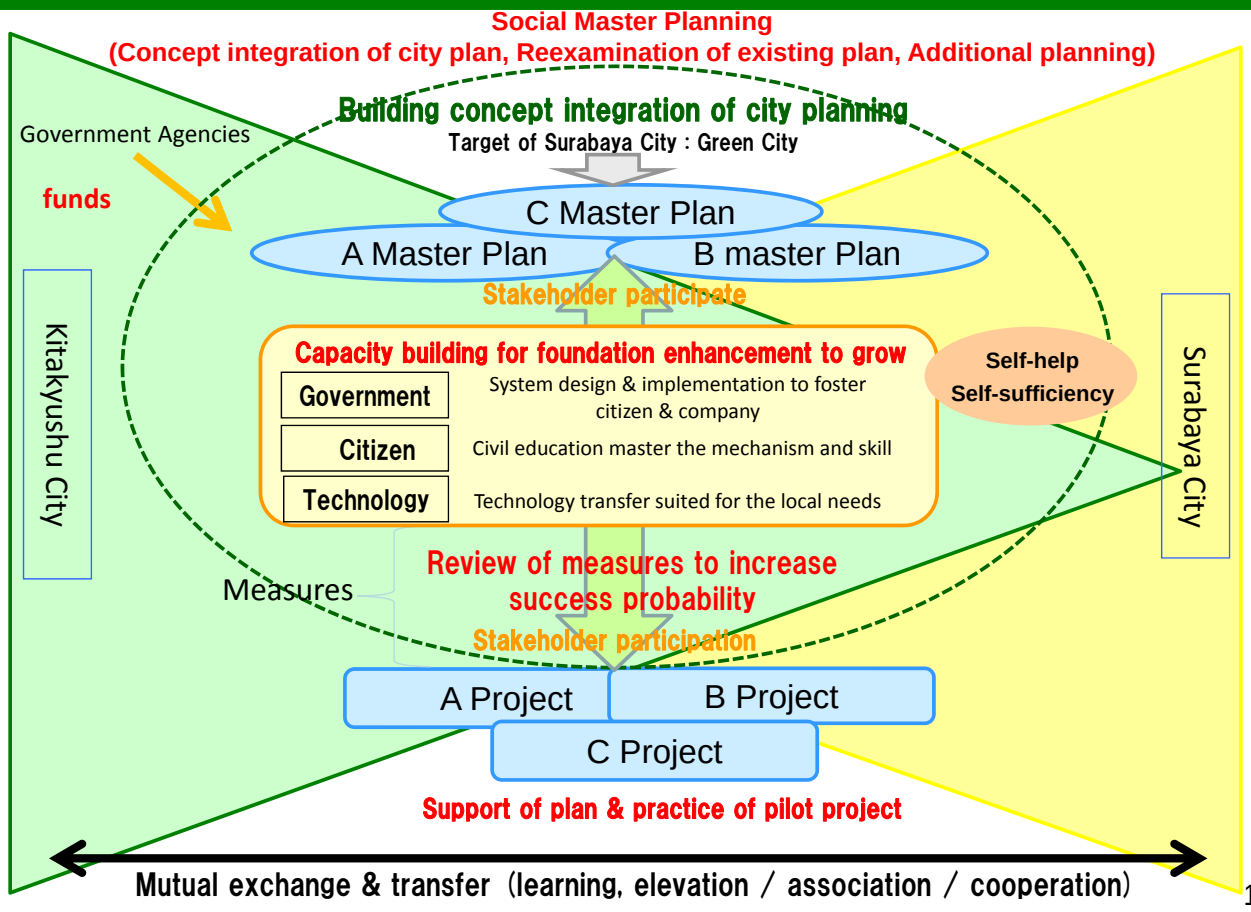
2. Every project is not approached by step-by-step to evaluate project results for the next project planning and is not approached from long-term point of view

* Waste management is the most important issue of Surabaya city and the city is conducting a pilot of intermediate waste recycling facilities, however, master plan of waste management is not prepared yet.

3. Discussion with stakeholders is very important to every project, however, responsible companies do not understand the discussion.

* Stakeholders do not understand the importance of obtaining the consent from local residents that is necessary for requesting local community to maintain demonstration equipments of drinking water.

Support of Social Platform Formation by Intercity Cooperation



Showroom of the Green City

We are aiming at creating a Showroom of the Green City in Surabaya by the activities based on the Green Sister-City.

1. Building a Model of Green & Low Carbon City

Build a model of Green & Low Carbon City in Indonesia, by using existing "Surabaya Vision Plan 2005 – 2025" (Urban Development Plan), by using the sectoral master plan and by preparing comprehensive city plan from "green and low-carbon" point of view. Dissemination of the model in every cities in Indonesia will contribute the CO2 reduction(26%) by 2020 which is the target of Indonesia.

2. Comprehensive support (from planning to implementation)

Past development & investigation ended by formulation of master plan and its implementation was entrusted to city's autonomy. However, the project is comprehensive project covering preparation of unified concept of town management, backup of planning & implementation of pilot project and human resource development to encourage Surabaya City and feasibility enhancement of master plan.

3. Administrative cost reduction by PPP

Each project can be implemented with less administrative cost by helping entry of private companies using PPP to avoid all the costs borne by public administration as in the past. Therefore, we will, in addition, promote regulatory & system reformation to remove the entry barrier of private companies.

Building Win-Win Relationships

Asian cities
Mitigate pollution and improve quality of life while reducing CO_2

Kitakyushu
Rejuvenate communities through overseas environmental business development primarily by Kitakyushu companies.

In addition to international environmental cooperation, when it comes to international environmental business development, our hope is to see the advancement of a uniquely Japanese approach, different from that of other countries, that will respect and bring joy to local residents.