The First Project Meeting of IGES-UE

June 23, 1998

Institute for Global Environmental Strategies

Urban Environmental Management Project (IGES-UE)

The First Project Meeting of IGES-UE

Foreword

Various environmental problems are generated along with the rapid economic development and industrialization of any region, and the extent of these problems has become increasingly serious in Asia's cities. The Urban Environmental Management Project has been launched as a project of the Institute for Global Environmental Strategies (IGES). IGES was initiated in April, 1998 in order to present innovative policy ideas and practical means to cope with global environmental problems.

The Urban Environmental Management Project, in particular, aims to propose sustainable development strategies for Asian cities which are undergoing rapid urbanization and industrial development. For this objective, it carries out case studies and comparative analyses of cities in the Asia Pacific region. The planned case study cities are: Shenzhen City, Dalian City, and some cities located in the Yandze river basin in China; Ulsan City in Korea; Tangulan City in Indonesia; and Kitakyushu City and Ube City in Japan. Research teams are formed to carry out case studies, with participation of experts from various countries and societies. The first Project Group Meeting was held on June 23, 1998 in Kitakyushu City to formulate the framework of case studies and discuss the direction and working plan of the project. The meeting took place following the regional workshop of IHDP-IT held on previous days. Core members of case study teams met together and presented the results of preliminary studies, expressing their views about the specific features of case study cities and the priorities of their studies. The research plan of the project for three years from now was discussed, and agreement upon the content and the guideline of the case study was obtained.

This report presents a record of this meeting. I believe that the information obtained during the discourse of this meeting will become the basis of the study. I also would like to express my deep gratitude to all participants who provided valuable ideas and information for implementing the project. Furthermore, the thanks of all participants are extended to Kitakyushu City for supporting us when this meeting was held.

Prof. Hidefumi Imura
Project Leader of Urban Environmental Management Project
The Institute for Global Environmental Strategies (IGES)

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Dalian Case Study *by Dr. Guang Xia*
Shanghai Case Study *by Prof. Rusong Wang*

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Tangerang Case Study *by Prof. Mohamad Soerjani*

15:50 **Research Proposal of Japanese Case Study**
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17:00 **Final Discussion**
Research Plan of FY1998
Case Study Guideline

18:00 **Closing Remarks**

Participants List

Participants List

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Prof. Hidefumi IMURA	Project Leader, IGES-UE / Professor, Environmental Systems Analysis and Planning, Kyushu University
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Research Plan of IGES-UE

Research Plan of IGES-UE

Presented by Prof. Hidefumi Imura
(IGES-UE / Kyushu University, Japan)

1. Background

* Cities as microcosms of environmental problems and solutions

Cities are microcosms in which the most intensive interaction between human activities and natural environment takes place. Changing the development patterns of cities is the key to the solution of not only local but global environmental problems such as climatic change. Cities are the test place of new policies, and successful policies in one city can be disseminated to the cities in differing countries.

* Economic development and urbanization in Asia

Cities in Asia are undergoing rapid transformation propelled by economic growth. The last few decades of the 20th century witnessed rapid economic development, urbanization and environmental changes in Asia. Nations such as China are achieving astounding economic growth at an annual rate of nearly 10%, riding the wave of industrialization. The investment for economic development is mainly made in cities, and the influx of population to cities is accelerated, attracted by increased job opportunities and richer life. Widening income gaps between urban and rural areas further encourage the immigration into urban areas, pushed out of poverty in rural areas.

* Environmental problem in Asian cities

We can notice two different types of environmental problems in Asia: problems of developing urban areas, and problems of less developed rural areas. It is in cities that the contrast of light and shadow of economic development is seen most clearly: cities enjoy more of most of the fruits of industrial development, while facing various environmental problems arising from strains of economic growth. In an early development stage where expansion of industrial production is of primary importance, factories are concentrated in cities, causing serious air and water pollution. Moreover, the improvement of urban infrastructures such as water supply, housing, roads, sewerage system and waste collection and treatment system does not catch up with the excessive concentration of population and rapid expansion of urbanized areas. Particularly, the increasing automobile traffics and the delay in constructing public transportation systems are causing traffic congestion and air pollution in many Asian cities. The urban population who cannot benefit from the economic growth is also increasing, causing various problems which are deeply rooted in poverty and the distortion in income distribution.

*** Necessity of improving the governance in urban environmental management**

Looking at the historical pattern of economic development and the occurrence of environmental problems in Asian cities, we can notice many similarities among them. As the economy develops, environmental problems take place. Then the environmental management and the problem solving capacity of cities are also improved. In many cases, however, the problems spread faster than the measures taken against them. As a series of new problems appear, there is no time to catch up with them, largely due to the inadequate administrative and financial capabilities As to the legislation and standards, it is necessary to improve their implementation in terms of effectiveness and efficiency. Thus the improvement of the governance in urban environmental management system is one of the common policy agenda of Asian cities.

*** Experience of Japanese cities: its efficacy and limitations**

From the historical and geographical standpoint, various environmental problems which Japanese cities have experienced can be presented as a typical example, or reference frame of common issues for many Asian cities. Some Japanese cities faced most serious and typical urban environmental problems, prior to other cities in Asia. Enforcement of strict regulation, and large investment in control technology and the establishment of urban environmental infrastructures have achieved significant improvement of the environmental quality in Japanese cities. However, there are a number of unsolved problems, such as air pollution by automobiles and increasing household wastes. Review and evaluation of the experience of the Japanese cities should be made in order to draw lessons which will be suggestive to other Asian cities, demonstrating their efficacy and limitations, and successes and failures.

*** Challenges and opportunities**

The Asian cities must face new challenges such as energy saving for limiting the emission of greenhouse gases, and establishment of recycling systems, in addition to the traditional problems such as air and water pollution control. The Asian cities which pursued material richness by economic development must make new challenges for realizing energy-efficient cities, lifestyles with less environmental loads, and resource recovery and recycling. They may benefit the advantages of the latecomers as they can utilize the know-how and technology which are already available in the cities in industrialized countries. Moreover, economic development and industrial production expansion in many Asian countries will provide new opportunities for them to improve financial and technical basis for urban environmental management. Best utilizing these favorable conditions, they must create environmentally sound urban development models which will not merely follow the past development patterns of the cities in the West.

*** New viewpoints required for improving urban infrastructures**

Urban infrastructures such as public transportation, sewerage and waste

treatment systems are essential to improve the urban environment. The fund raising for those urban infrastructures should be established according to the present situation of the Asian cities. With regard to technology, use of small-scale decentralized local technology should be encouraged in combination with large-scale centralized technology which has been traditionally adopted in Japan and other countries. Promising examples of such technology may be solar and biogass energy, and new information communication technology. In conjunction with the establishment of these technological systems, reform of socioeconomic systems should be studied in order to reduce the environmental loads of urban activities.

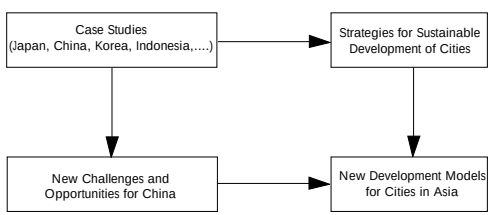
2. Objectives

The final objective of this project is to present innovative ideas and models which will guide the urban environmental management policies in the trend of economic development in Asia toward the next century, For this objective, we should first of all file the experiences of environmental management in different counties, and draw lessons clarifying successes and failures, based on the comparative assessment and evaluation of the past experience and present situation of urbanization and environmental problems in various Asian cities. Then we should demonstrate concrete examples of policy tools, institutional arrangements, technological options, urban planning, infrastructure provision, financial mechanisms, etc. in order to ensure improved urban environmental management.

The project will collect and analyze relevant data and information to support the related works. This exercise will improve the information basis about urban environmental management systems (or "environmental governance") which will be useful for central and local governments, citizens, and businesses to adopt more effective and efficient policies. It will also enhance the information exchange among countries and cities about their experience in urban environmental management

Another objective of the project is to make a critical review of the Japanese experience in urban environmental management. The technical, legal and social measures adopted in Japanese cities for environmental management may provide useful information to other Asian cities which are undergoing rapid industrialization and suffering from industrial pollution. We should analyze the effectiveness and limitations of Japanese approaches and discuss the applicability and transferability of Japanese models to other cities in Asia. We should also examine the recent effort of Japanese cities to create new models of urban development based on eco-technology, eco-businesses, and

Fig. 1 Objectives of the Project



changing consumer attitudes and behaviors.

3. Content and Method

3.1 General

The output of the projects (i.e., reports) should be useful for central and local government authorities, private companies, citizens, NGOs, etc. The project should be conducted in close communication with other IGES projects, inter alia, project on "environmental governance". The project will give special attention to the relationship between industrialization and urbanization which are taking place concurrently in many Asian cities, and seek for the cooperation with IHDP-IT project. The project should emphasize its uniqueness and comparative advantages, avoiding duplicative efforts with related projects conducted in other organizations.

We will select the cities for case studies from the countries, and collect relevant information and data concerning the past experience and the present situation in respective cities. The research consists of site research, data collection according to common questionnaires, and provision of data by local experts and a series of workshops. For this exercise, we will ask participation of local experts from case study cities. Then, we will examine new models for environmentally sound urban development and present strategies to achieve it.

3.2 Study Items

a. Comparative study on the past experience, current situation, and mechanisms of urbanization and environmental problems in Asian cities

Case study cities will be selected among cities subject to rapid economic development, population increase and land use change. Then, we will identify environmental problems currently occurring, and economic and social mechanisms causing such problems, and quantify the relationship between the population growth, expansion of economic activities and industrial production, motorization, change of consumers' lifestyles and changes in environmental qualities. We will look at the change in land use in cities and their surrounding areas and analyze the structural change such as expansion of built-up area and decrease in farmland. At the same time, we will review the history of urban infrastructure improvement and analyze their achievement and shortage. We will review the successes and failures in urban environmental management practices and discuss the measures to be taken for the future, and analyze the effectiveness and limitations of legislative and administrative systems, technology, and socioeconomic systems in coping with the problems.

b. Cities in industrial transformation: past experience and new models for urban development and environment in Japan

Industrial production is the basis for economic development of cities, especially for industrial cities. Cities have different environmental problems and adopt different system of environmental management, depending upon the types

of industries located in their areas. In Jpan, for example, it was the industrial cities specialized in heavy and chemical industries that experienced the most severe industrial pollution problems in the course of rapid economic development in the 1960s. Those industrial cities, however, have been transformed to business cities which rely more on service industries rather than manufacturing industries. Moreover, even in the industrial cities, the main industry shifts to high-tech industry such as information /communication industry. In the manufacturing industry, on the other hand, more attention is paid to resource recycling and "zero emission" technology, and there is a great possibility of new environmental businesses and eco-industry. Using the Japanese industrial cities such as Kitakyushu City as a model, we will analyze the content of current industrial transformation, and study the possibilities and limitations of applying such a model to other Asian cities.

The change in the industry leads to changing behaviors of consumers who are at the downstream of economic system. The changing lifestyle in Asian cities toward more abundant use of resources and energy is reminiscent of that in Japan in the past rapid economic growth period. This change is extensive and rapid and it is of great significance for environmental management in cities. Therefore, we will analyze the relation between the diffusion of endurable goods, change of dietary habits and the change of housing conditions such as space / air-conditioning and the increasing environmental loads generated by cities, and discuss measures for transforming the current mass consumption development pattern to a more sustainable one.

The result of this research will be submitted to IHDP (International Human Dimensions Programme) Industrial Transformation Project.

c. Strategies for improving urban infrastructures: mass transportation, sewerage, waste management, and water and electricity supply

To improve urban environment, it is essential to establish infrastructures such as transportation system, sewerage system, and waste collection, treatment and disposal system. In Asian cities, the construction of business buildings and roads are rapidly advancing, but the improvement of urban environment infrastructures is delayed due to the finacial difficulties. We should present strategies for establishing more effective and efficient urban environmental infrastructures, taking into account the economic and technical conditions in which the Asian cities are placed.

We will analyze the environmental loads generated by economic activities of the cities in terms of the use of materials and energy and the amount of waste generated from the industrial activities and citizen's life. Then we will identify the necessary levels of urban infrastructure improvement to achieve the environmental targets. If the urban environmental infrastructures are to be improved to the level of today's Japan, an enormous fund will be required. We will discuss technical and financial feasibility and the goal of environmental improvement, assuming options such as the case where the centralized systems as adopted in Japanese cities are to be established, the case where the decentralized

systems are preferred instead of the centralized systems, and so forth. Finally we will try to present strategies for improving urban environmental infrastructures which aims to establish more advanced recycle city, or "eco-city", than the traditional Japanese cities. Particularly, we will focus on the strategies for managing urban traffics by establishing public transportation systems, encouraging resource recycling and the use of natural energy.

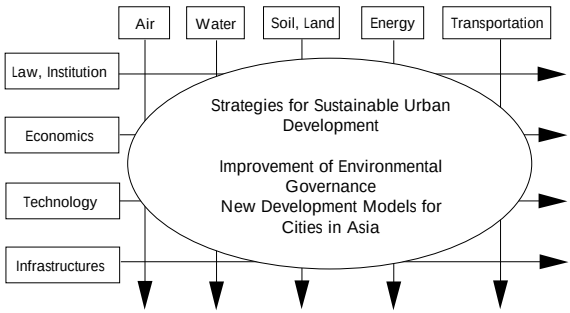
d. Strategies for improving governance in urban environmental management

Asian nations have rapidly improved their environmental laws, regulation and standards. Cities are empowered to carry out city planning and control the land use. Thus the law and urban environmental management systems have been established in a sense, but they are not effectively enforced. Moreover, very little investment has been made for urban environmental infrastructures mainly due to the lack of fund. What is required for urban environmental management in Asian cities, therefore, is the improvement of environmental governance. We will study the present situation of the laws, regulations, standards and the environmental management system, sorting out the problem of environmental governance in Asian cities. Then we will present strategies for improving the governance in the urban environmental management, based on case studies and comparative analysis of Asian cities with respect to environmental legislation and its enforcement and implementation, administrative capabilities, financial tools and mechanisms and technological options.

3.3 Case Studies

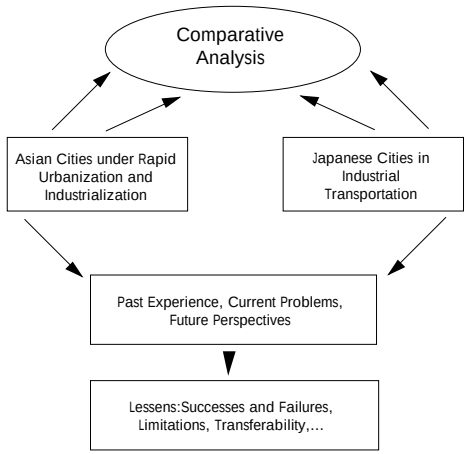
Case studies on some selected cities will play an important role in the project. Each case study will be consisted of the preparation of background paper by the local study team, and a review meeting in the city. From each case study city, a policy review paper will be prepared. Besides case studies, supplementary studies will be undertaken on intangible elements which can not be covered by case studies. Finally, the synthesis report will be prepared, integrating the major results of all relevant works including the results of case studies

Fig. 2 Scope of the Project



a. Criteria of selecting the case study cities

Fig. 3 Case Studies



* Cities facing the most serious problems (e.g., most polluting city in the country), or cities requiring early countermeasures
* Cities which have typical experiences which can serve as lessons to other cities
* Cities which can serve as a model to other cities
* For each case study city, one or two major issues should be identified (ex., battles against pollution and promotion of "eco-industries" in Kitakyushu City)
* Regional balance
* Government support and basis of collaboration
* Data source and availability

b. Local study team and preparation of the background paper

* Form a local working team which will collect and analyze data relevant to the case study city, and prepare the background paper which will be submitted to the examination by the review team
* Background data to be collected in the paper (example)

  -Socio-Economic Context

  -Demographic situation / immigration

  -Industrial production

  -Environmental quality

  -Environmental infrastructures

  -Legislative framework

  -Institutional arrangement

  -Public / private investment

  -Decision-making process

  -Public participation and awareness

-Other relevant data

* Paper reviews the experiences of the city and demonstrates successful and non-successful achievements

c. Review meetings

* In each case study, hold a review meeting in the city with participation of IGES research team members, the related local and central government authorities, and other experts

* The meetings will review the performance of environmental management systems of the case study city on the basis of the background document

* Then prepare a policy report

d. Common basis of comparative studies

* Case studies should have common analytical basis

* For each city, take up one or two major issues of concern instead of dealing with many diverse issues (e.g., air, water, waste, energy, land, etc.)

* Driving force (Pressure), State, and Response; Cause-Effect Relationship

* Actions taken

* Policy instruments adopted

* How are they implemented and what are their achievements?

* Responses by government, citizens, businesses, etc

* What were the main causes of success and/or failure (e.g., legislative measures, institutional arrangement, economic factors, available technology, public and private investment, decision-making process, public participation and awareness, public relations, dissemination of information including newsletters, reports and books, etc.)

e. Policy review papers

* Policy review papers will be prepared after the review meetings, which should be policy-oriented and suggestive for the future direction of the environmental management of the cities.

4. Expected Results:

As the scope of research target is wide and far-reaching, the Synthesis Report will be prepared based on case studies in order to draw up policy recommendations to various parties. In addition, several policy reports on specific issues of concern will be prepared, and symposiums will be organized to disseminate the research result.

4.1 Synthesis Report

The expected formula of the synthesis report is as follows:

a. Comparative Analysis: The History and Current Situation of Urban Environment in Asia

* Summarize major findings of case studies and other related studies in a way that they will be useful for policy makers, and other stakeholders

b. Strategies for Achieving Sustainable Development of Cities

* Make synthesis of major results of all case studies and other related works
* Demonstrate innovative ideas and models to guide the urban environmental management
* Demonstrate innovative policy instruments to improve governance for urban environmental management
* New development patterns for sustainable cities (e.g., production and consumption patterns, lifestyles, institutions, technologies, economic instruments, education and information, etc.)
* Technology transfer
* Financial mechanism
* Strategies to take advantage of late-comers
* Networking all of stakeholders
* Inter-city cooperation
* Others

c. Recommendation for Actions

* More effective and efficient implementation of the management system
* Countermeasures for Air, Water, GHGs, Wastes, Energy Conservation
* Urban infrastructure improvement
* Urban Planning / Land Use Planning
* Capacity building
* Demonstration project
* Identify further data and information needs
* Others

d. Specific Recommendation to Target Groups

i. National Government (Developed and Developing Countries)

ii. Local Authorities

iii. Private Sector (Industry, Energy, Transportation, Agriculture, Tourism, Finance, etc.) and NGOs

iv. International Organizations (Rio+10, World Bank, Asian Development Bank, UN Bodies)

v. Academic society (e.g., universities, institutions, research groups)

4.2 Reports on Specific Issues

Possible title and content of the reports are as follow:

a. Report on the "Current Situation and Problems in Environmental Management in related to Asian Cities"

It will analyze the historical process and the present situation of the urbanization and environmental problems in Asian, centering on the actual problems in case study cities.

b. Report on "Experience of Japanese Cities in Industrial Transformation"

It will examine the effectiveness of the environmental management systems adopted in Japanese industrial cities, and discuss their applicability to other Asian cities. It will be submitted to the IHDP industrial transformation project.

c. Report on the "Strategies for Improving Urban Environmental Infrastructures"

It will present strategies for establishing public transportation required for measures against traffic congestion and air pollution, resource recycling and more efficient use of natural energy.

d. Report on the "Strategies for Improving Environmental Management Capacity in Asian cities"

It will present strategies for improving environmental governance in Asian cities, with respect to the implementation of laws and regulation, finance raising, technology, capacity building, etc.

Case Study Guideline of IGES-UE

Case Study Guideline of IGES-UE

Presented by Dr. Xuemei Bai (IGES-UE, Japan)

1 Case Study Guideline

1.1 Case Study City Selection

- Criteria

(a) Necessity: e.g. cities facing the most serious problems, cities requiring early countermeasures, etc.

(b) Representative: e.g. cities having typical experiences, cities representing typical social, economic and political situation, cities with regional representative, etc.

(c) Feasibility: e.g. government support, basis of collaboration, data source and availability, etc.

- Selected Case Study Cities for the First Phase of Study

(a) Chinese Case Study Cities: 3 cities are selected as first phase case study cities according to above criteria. Names of case study cities and key words reflecting their main features are as follows:

Shenzhen: Southern Coastal city, Zhujiang River Delta, Market economy, rapid urbanization/land use change, rapid development of tertiary industry, special economic development zone, advanced environmental management and urban planning, etc.

Shanghai area: Southeastern Coastal area, Yangzi River Delta, combination of planned and market economy, historical agricultural area, rapid development of Village and Township Enterprises (TVE), rapid construction of urban infrastructures, waste water from TVE, water body pollution, etc.

Dalian: Northeastern Coastal area, comprehensive industrial city, stagnation of state owned enterprises, international cooperation in environmental protection and management, etc.

(b) Korean Case Study City

Ulsan: Southeastern coastal city, industrial base of Korea, rapid industrialization, air pollution, environmental management, etc.

(c) Indonesian Case Study City

Tangrang: Suburban city of Jakarta, rapid urbanization, interaction with Jakarta metropolis

(d) Japanese Case Study Cities

Kitakyusyu: Industrial city experienced and overcame industrial

pollution, industrial transformation, Awarded Global 500.

Ube: similar to Kitakyusyu, Awarded Global 500.

1.2 Expected Role of Local Case Study Team

- Provide Background Paper of Case Study City
- Collect relevant data
- Conduct Case Study and Present Case Study Reports
- Cooperate with IGES Core Research Members to Conduct Field Survey / Interview / Questionnaire
- Co-organize Local Review Meeting with IGES Researchers
- Provide Necessary Materials for Comparative Studies

1.3 Methodology

- Review of Existing Research
- Data Collection:

  Example of background data to be collected

  - Natural Conditions
  - Socio-Economic Context
  - Demographic situation / immigration
  - Industrial production
  - Environmental quality
  - Land Cover Map and Land Use Change
  - Environmental infrastructures
  - Legislative framework
  - Institutional arrangement
  - Public / private investment
  - Decision-making process
  - Public participation and awareness
  - Other relevant data
- Major Aspects to be covered by Indicators (see appendix)
  - Physical / Geographical Indicators
  - Social / Health Indicators

- Economic Indicators
- Environmental Indicators
- Institutional / Legislative Indicators
- Ecological / Natural Resources Indicators

- Interview / Questionnaire
- Field Survey
- Working Group Meetings and Workshops in Case Study City

1.4 Contents of Case Studies

- Prepare Background Paper, Review Existing Study
- Collect Relevant Data, Materials
- Review and Define Typical Environmental Problems of Particular City
- Conduct Research Focused on the 4 research Items Proposed in Research Plan, and One or two Typical Problems of the City (Region)
- Policy Review Paper

1.5 Output of Each Case Study

- Background Paper
- Case Study Report Covering the 4 Aspects of the Project and Typical Problems of the city
- Policy Review Paper
- Research Papers Published in International Journals and Conferences
- Data / Materials Serving as Input for Comparative Study
- Synthesis Reports (final stage)

2 Example of Field Survey: Outline of Field Survey Mission in Shenzhen Case Study

- Date: June 1-7, 1998
- Member: 8 Members from Japan (IGES, Kyusyu University FIP)

  3 Local Case Study Members from Peking Normal University
- Visited Places and Survey Items:

  Shenzhen River Treatment Project, Protection of Bio-diversity

  Xili Dam Drinking Water Reservation Area

  Environmental Education Base

Press Conference of Shenzhen Environmental Protection Agency

Nanshan District Environmental Protection and Management System Development of Environmental Technology

- Background Paper Prepared by Prof. Shi`s Group

3 Case Study Related Working Schedule (Draft)

* 1st Year (1998/99): Preparation and Initiation of the Project

February 8-10, 1998	2nd International Workshop for Strategic Research on Global Environment
April 1998	Selection of Case Study Cities
	Preparation of Guidelines for the Study
	Organizing Local Research Group
May 26-29, 1998	Preliminary meeting with Korean Case Study Team
June 1-7, 1998	First Field Survey to Case Study City - Shenzhen
June 23, 1998	1st Project Meeting (Kitakyusyu)
June 24-25, 1998	Regional Workshop of IHDP Industrial Transformation (IHDP-IT) (Kitakyusyu)
Aug.-Sep 1998	Field Survey to Case Study City - Shanghai
September 1998	Field Survey to Case Study City - Ulsan
October 1998	Field Survey to Case Study City - Dalian
	Present Existing Research Papers / Materials on Case Study Cities
Jan.-Feb. 1998	Selection of Second Phase Case Study Cities
March 1999	Present Background Paper
Mar.-April 1999	Local Workshop / Group Meeting in Shenzhen

* 2nd Year (1999/2000):Continuation and Evaluation of the Case Study / Initiation of Comparative Study

April 1999	Start of Studies in Second Phase Case Study Cities
May -Jun. 1999	Mission to Case Study Cities

June 1999	3rd IHDP Open Meeting (Shonan Village Center)
Jul.- Oct. 1999	Mission to Case Study Cities
October 1999	Present Existing Research Materials on Case Study Cities
	Background Papers (2nd phase Case Study Cities)
March 2000	Local Workshops/ Group Meeting (Place to be decided)
	Final Report including all Relevant Data/Materials of First Phase Case Study Cities

*** 3rd Year (2000/01): Completion of the Project and Dissemination of the Results**

April 2000	Mission to Case Study Cities
May- Dec. 2000	Supplementary Study
March 2001	Local Workshops/ Group Meetings (Place to be decided)
	Final Report including all Relevant Data/Materials of Second Phase Case Study Cities
May 2001	Workshop for the Finalization of the Project
September 2001	Publication and Dissemination of the Report

Chinese Case Study

Shenzhen Case Study

Presented by Prof. Peijun Shi
(Beijing Normal University, China)

I would like to introduce two parts of our case study in Shenzhen City. The first part is about the preparation of the background report, and the second part is about the carrying out of the research of Shenzhen City.

Shenzhen City is very near the Zhujiang Delta area (Fig.1). Shenzhen City is a very typical coastline city. Since the 1980's open policy has been used in our country and in Shenzhen City, it was implemented first. Shenzhen is divided into two parts. One part is a special region and the other part is Shenzhen City. In this special region, there are three local Districts, named Luohu, Nanshan and Futian. The east area is Longgang district and the west area is Baoan district, both of which are located outside this special district. These five local districts belong to

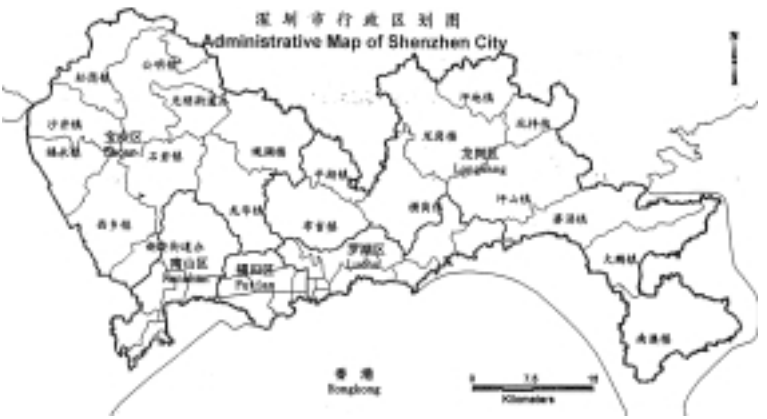


Fig. 1 Geography Location of Shenzhen City

Shenzhen City. Our research target is Shenzhen Special City, not Shenzhen City.

I would like to introduce the preparation of the background report of Shenzhen City's urbanization and environmental situation. We used Prof. Imura's outline on preparing the background of a case study. It consists of ten parts.

The first part concerns the physical environment. Geographic location, geology and landform, climate, water system, soil and vegetation are included. The second part concerns social and economic issues. The third part deals with population. The fourth part is concerned with major industries and products. The fifth part concerns environmental quality. The sixth part deals with environmental

infrastructure. In China, many researchers do not use the term ‘environmental infrastructure’; they just use ‘environmental protective engineering’. But now some researchers are using this new idea of environmental infrastructure. In our country, infrastructure is only used in technology, water works and other engineering fields, but in our research, perhaps this new idea can be used. The seventh part concerns the legislative system on environmental management. In our country, the environmental management system is very complete. Different levels have different environmental management systems. Especially in Shenzhen City, the environmental management system is very special. The eighth part deals with institutions. The ninth part concerns public and private investment. This part is a very difficult one, we have a lot of works to do now, but we will prepare to do this work. The last part is about environmental decision-making procedures at the municipal level.

We prepared three documents. The first document is only in Chinese. When Prof. Imura visited Shenzhen City, we prepared the background paper only in Chinese. Now we have prepared Shenzhen's urbanization and environmental management strategy and the China-Japan joint project-environmental background report (draft) in English.

I would like to introduce the contents of the background report. A detailed account of these ten parts is contained in the attached papers.

The first part involves the physical environment. Geographical location is very important for physical environmental research. Shenzhen City is a coastal city in the Zhujiang delta. We determined its geographical location, such as regions, coastline, and cities as a sub-topic. Shenzhen City borders the Daya Bay to the east and is linked to the mouth of the Pearl River in the west. Separated by the Shenzhen River in the south, it is contiguous to Hong Kong. We determined two key phrases, 'nature determinations field' and 'political determinations'. Divided by the Shenzhen river, to the south is Hong Kong, to the north are the Shenzhen special regions. Shenzhen has lots of hills and medium-sized mountains. The low mountain area percentage is 9.2, hill is 39.6, platform is 22.6, and terrace plain is 26.17. Climate is an important factor too. An East wind prevails in Shenzhen City during most of the year. In winter there are mainly NNE winds and in summer SEE winds. The annual temperature is shown here. It shows the temperature of the south region. Shenzhen City has high precipitation.(Here is the map of the water system). There are two parts. One is Shenzhen river. It is a border river. This river belongs to both parts. So this river's quality is very important. Since 1995, the Shenzhen government and the Hong Kong government have been working together to carry out the Shenzhen river environmental engineering project. Now the first part of the project is finished. Last year the second part of the project was begun. The aim is to control flooding and treat water pollution. Part of the water flows directly to the sea, and the other part flows into Zhujiang River at first and then flows into the sea. (Here is the picture of the analysis of Shenzhen's soil chemical composition.) It is not new data, but it shows the character of Shenzhen's soil.) It includes five styles: mountain yellow soil, mountain red soil, red soil, paddy soil and coastal sand soil. Red soil is the main type. Physical

environment has six parts. It is important to first understand the landform and climate in order for us to understand this area's physical environment.

The history of Shenzhen City is very short. In 1980, the Shenzhen economic special zone was established. It is a very young city. The development speed of Shenzhen City is very rapid. In 1979, the GDP of Shenzhen was very low. Please note the tables 1 and 2, and let me explain. From these tables we can see that industries increased very quickly and agriculture decreased very quickly.

Table 1 Major National Economic and Social Indexes

Index	unit	1979	1990	1994	1996
Year-end permanent population	10^4persons	31.41	201.94	335.51	358.48
Year-end social labors	10^4persons	13.95	109.22	223.05	255.48
GDP	10^4yuan	19638	1716665	5671471	9500446
Total amount of social fixed assets investment	10^4yuan	5938	579222	2309567	3275270
Total employee salary	10^4yuan	2952	227392	852332	1284558
Annual average salary	10^4yuan	769	4304	10572	
Gross value of industrial outputs	yuan	7128	2202180	9518175	14276969
Total agricultural value	10^4yuan	13106	119205	224776	273246
Total expert amount	10^4yuan	930	299581	1830921	2120781
Revenue	10^4US$	1721	217037	743992	1317490
College and University	10^4yuan		2	3	2
Middle school		24	49	56	71
Sanitary agency		62	354	496	1422

Table 2 Annual Gross Value of Industrial Outputs (calculated at the price of the same year)

Year	Total amount	Light industry	Heavy industry	Year	Total amount	Light industry	Heavy industry
1979	7128	6307	821	**1988**	1012739	779258	233481
1980	10632	9265	1367	**1989**	1477470	1080785	396685
1981	26692	25172	1520	**1990**	2202180	1657859	544321
1982	38833	34453	4380	**1991**	3153966	2233705	920261
1983	755993	61513	14480	**1992**	4347007	2971348	1375659
1984	172132	137698	34434	**1993**	6778008	4575096	2202912
1985	246662	194108	52554	**1994**	10637396	6134019	4503377
1986	340227	266318	73909	**1995**	12264893	6651811	5613082
1987	558311	433738	124573	**1996**	14276969	8003206	6273763

The third part concerns population. Many people came from outside the city, only 30% of the population belongs to Shenzhen City. Electronic products, electronic equipment, food, clothes and fiber products, metal products, chemical materials and products, plastic products, culture and sports products, transport equipment, and medicine are the major industries and products. The major industrial products of Shenzhen City are determined by the major industries, for example, TV set recorders, telephones and PC computers of the electronic industry. New industry system were established here.

The fifth is environmental quality; we did detailed work on this part. Another research team provided us with the data on environmental quality. But some of the data is new, that which is from the local environmental management protection agency. So some of the data is from the monitor and some of the data is from the other research team. Environmental quality before and after 1979 were compared, so we can see what happened in this area. Some data before 1979 is not available for this research. This only shows the data for 1986. Zhongshan University did research on the environmental impact in Shenzhen City, and this data is from that research. We need to do the new research of environmental impact work to get new data, and then we can compare them at different stages. Here are the tables of the energy consumption, and water pollution situation.(See Table 3 and 4) Many researchers are very concerned about the acid rain problem in Shenzhen City. I

think it is not very serious in Shenzhen City. Now as the time is limited, I would like to show some current environmental quality data. Here only the official data from the Shenzhen environmental protection agency is used. (See table 5) The data on environmental infrastructure is not very detailed.

Table 3 Energy Consumption of Shenzhen City in 1986

Item	Coal	Coke	Petrol	Diesel oil	Kerosene	Heavy oil	Electricity	LPG
Quantity	122099	6	36050	114617	1458	16859	37157	10859
Standard coa	87179	5.8	53030	167008	2145	24085	45439	18616

Table 4 Shenzhen Major Water Pollution Sources in 1986

Unit: t/a

Name	Industrial waste water	Domestic sewage	COD/BOD
Shenzhen Paper making company	1128445	11760	283/137
Zhongguan Printing and Dyeing Limited Company	1099680	76800	345/56
Huamei Iron & Steel Limited Company	204000	6000	---
Aihua Electronics Limited Company	124591	29952	---
Shekou kaida Industry Limited Company	128000	72000	---
Dyeing Min, Huasi Company	115000	4000	13.14/2.24

Table 5 Shenzhen City 1996, 1997 Wastes Discharges

Item		Unit	96	97
Waste gas emission	Industrial gas emission	$10^7 m^3$	357	348
	Smog emission	T	3661	3452
	SO2 emission	T	19474	20510
	Dust emission	T	113	69
Waste water discharge	Waste gas emission	$10^4 t$	51794	56155
	Industrial waste water discharge	$10^4 t$	3342	2666
	Industrial waste water treatment rate	%	99.2	98.3
	Urban sewage treatment rate	%	10.4	25.1
Solid wastes discharge	SEZ refuse disposal	$10^4 t$	84.89	96.44
	Industrial solid waste production	$10^4 t$	30.11	35.58
	Comprehensive utilization of ISW	$10^4 t$	24.91	30.28
	Comprehensive utilization rate	%	82.7	85

Finally I would like to introduce institutions and environmental decision-making procedures. From the national level to the province and city level, environmental decision-making procedures are different. I suggest Prof. Imura determines which indicator we can use to compare them.

Let me introduce the outline of China's Shenzhen case study. The special study consists of three parts. The first work is to complete a background report. The second work is to complete the special study report. (1) Reform policies, industrial transformation and environmental infrastructure construction. (2) Environmental law and environmental administration in the rapid urbanization process. (3) Environmental capacity and environmental security in the urbanization process of a sub-tropical region. This work is very important. Some researchers do not care about the natural eco-system services. But the eco-system service is a very important way to understand the local environmental management. We should take into consideration open policy, and the special economic region's environmental management system and environmental governance.

Prof. Imura

Thank you Prof. Shi for your report of the study you have done and the plan of your future work. Now I would like to invite Dr. Xia to make a presentation on the Dalian case study.

Dalian Case Study

Presented by Dr. Guang Xia (State Environmental Protection Administration, China)

The length of the coast line of Dalian City is 1906 km. The forest cover percentage is 35.3%. Total population is more than 5.37 million. As for its economy, in 1996, the tax revenue reached up to 10 billion Yuan, ranking 6th in the whole country. The economy of Dalian City is powerful. The length of the Dalian City road line was 1023km in 1996. House central heating percentage is 86.4%. Port handling capacity is 70 million tons/y. Industry is the main part of Dalian's economy. Dalian City is an important industrial base in China, with the main products being ocean boats, diesel locomotive, machine tools, petroleum and chemical products, and building materials, etc. Dalian City is not a pure heavy industry city. It has comprehensive industry. Dalian City is a beautiful place. It is also one of the ten hot-point cities in China. In 1996, foreign tourists totalled 163 thousand, more than 15 million domestic tourists visited Dalian. More than 13 universities and colleges are located in Dalian; it is also a cultural base city in China. Dalian is a coastline city. In China Dalian City is a port construction, transportation, industry and tourist city. Dalian is one of the most open, active, rapidly developed areas in China. Dalian's comprehensive economic capacity ranks 8th among cities in China. That's the social and economic situation of Dalian City.

Let me talk about the environmental situation of Dalian. In all we may say Dalian City has a beautiful environment. Its environment quality is relatively good among other similar cities in China. Dalian is one of the six "Environmental Protection Demonstration City in China". Beijing, Shanghai, Guangzhou have not been elected as environmental protection demonstration cities. Dalian City has invested a lot of money in environmental foundation and environmental infrastructure construction. Also there has been great achievement in the field of environmental legislation and environmental management. So in many aspects, the environmental protection of Dalian is a model for cities in China. Dalian has cooperated a lot internationally, in particular the Dalian environmental protection Model Region construction is an on-going project. Dalian's environmental protection works provide a lot of helpful lessons for other cities. However, the environmental status in Dalian is quite backward compared with the environmental indicators in the advanced cities in developed countries. For example, in winter, the SO_2 concentration in Dalian is an average 7 times higher than in Kitakyushu City, the float dust is 5.3 times higher than that of Kitakyushu and others. The wastewater treatment ration just 15%, and it is 100% in Kitakyushu. Dalian's environmental quality is somewhat backward compensation with advanced cities. The environmental status in Dalian is related to industrial layout and the technological conditions in its history. Therefore fundamental industrial transformation is definitely needed. Lots of money should be put into the environmental construction. Dalian has already set up long-term environmental

targets. It will spend 8 years to reducing its pollutants by two thirds until the year 2005. And by 2015 Dalian will bring its environmental quality to the level of advanced cities in the world such as Kitakyushu. It is an ambitious target. The target is to reach the level of an advanced city in 2015. This is a table of Dalian's environmental quality goals in 2005.

Table 1 Dalian's Environmental Quality Goals in 2005

Monitoring Items	SO2	NO x	CO	TSP	Dust ($t/km^2 \cdot month$)
Goal	0.040	0.05	1.20	0.15	15.0
First Class Standard	0.02	0.05	4.00	0.08	8.0

Let me show you my proposal concerning the study. Following the material from Prof. Imura, Dalian has had typical experiences of environmental protection. Starting from this point, in the first part I would like to review the history of the urban development of Dalian City. In this part, natural conditions, the origin and development of the city, population growth and status and social-economic characters will be studied. From this part, Dalian's feature can be shown. The second part will be the current status of Dalian. Economic development, urban infrastructure, environmental status and priorities and environmental protection achievements will be studied in this part. The third part will be environmental protection policies and measurements. Environmental legislation and local policies, environmental management and effectiveness, the comprehensive innovation of urban environment, the environmental protection organizations and decision-making processes, public awareness and participation, environmental investment, and environmental international cooperation will be studied in this part. The fourth part will be the experiences of Dalian. We will consider the issues deeply in this part. The social-economic background of environmental problems, different urban development strategies, the impacts of industrial structure and technology on the environment, the probability of industrial transformation, the strategy for urban transportation and other public facilities will be studied in this part.

The fifth part is the trans-century urban development path: Dalian's perspective on development and environment. We would like to make some policy proposals in this part, such as adjusting urban planning and industrial layout, solving the priority problems, strengthening the environmental infrastructure, and capacity building for environmental management.

This is my brief introduction to show how this study should be taken. Dalian City has many experiences and lessons for the other cities in China and also in other developing countries. I hope through this study, we can provide very clear or very helpful consultation for the government and public society.

Prof. Imura

Thank you Doctor Xia for your nice presentation about your case study in Dalian. We have already had the presentation by Dr. Shi about Shenzhen and Dr. Xia about Dalian. And we have another presentation by Prof. Wang about the

Shanghai area. These areas have different characters and I think each of these three areas are important for our study.

Shanghai Case Study

Presented by Prof. RusongWang (Chinese Academy of Sciences, China)

I think we have three cities for case study in China. One is just as Prof. Shi said Shenzhen near Hong Kong. The second is Dalian, in the north part. I would like to introduce the third one near the Shanghai area. I think these three cities have different types of urbanization and industrialization. Shenzhen is a very rapidly developed city near Hong Kong. Many industries are owned by foreign companies and the third industry dominates the whole industry. Dalian is in the north part. In this city urban environmental management is quite controlled. This is one thing. Another thing is that there are some state owned industries in these cities. They have done a lot of to change the old plan economy to a market economy. This may be a new kind of model of how to renew the old cities in China. And in China now we have more than 300,000 state owned enterprises, which face a very difficult situation. The third one is about Shanghai, which I would like to introduce.

Fig. 1 Distributive Pattern of Towns and Cities by Population in Yangtze River Delta

You see, this is Shanghai. The rural industry in this area developed very rapidly. And the regional urbanization is also developing rapidly. From Shanghai to Suzhou, you will visit Suzhou, Wuxi, Changzhou, and Nanjing. Now there are nearly 40 organized areas. In this area, much research was done on the rural industry we call township and village enterprises (TVE), which accounts for more than half of the whole area's industries output. But environmental pollution is also very serious. I would like to introduce more detailed figures, but just for the proposal. Yangtzi River Delta is in the east coast of China, with a population of about 37 million people and an area of nearly one hundred thousand square kilometers. Shanghai is the largest city; there are more than 12 million

people. Other cities that you can see in this figure are: Nanjing, Changzhou, Wuxi, Suzhou, Hangzhou and Ningbo. These are middle sized cities with more than 1 million people and a lot of cities of different sizes, developed especially during the past two decades. So why do we choose this area as our target area? The reason is that this area has more than 5000 years of culture and that the scale of urban growth and construction are tremendous in this area. The rapid development of rural industry called TVE developed here. And there are many economic development zones and a lot of different kinds of economic development areas. So especially from 1991, these areas like Pudong and some small country towns including different kinds of cities, provinces and townships, have been designated economic development areas or zones. Also a big change of landscape in this area has been taking place. The water pollution is terrible. Especially around Taihu Lake, 73% of water is under GradeáV of the national standard. So urban environmental management is very important. Each town developed dependently, so we have to coordinate different towns. This is the key problem. We chose this area as our target and we can identify that in this area Changzhou, Wuxi and Suzhou are rapidly developed cities. Maybe we will chose Changzhou or Wuxi as our target. But in the future we will prepare comparative studies between Changzhou, Wuxi and Japanese cities, for example, Tokyo, Nagoya and Osaka. We will carry out comparative studies to learn about the Japanese experiences in urbanization and industrialization.

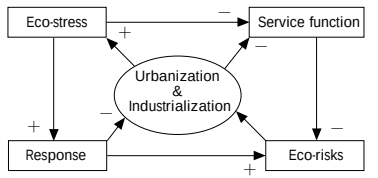
Now for the objective of this project. There are four objectives. One is to identify problems, experiences and lessons of the urban environmental management in this area. The second one is to prepare background data in the target area in order to make comparative studies for cities in Asia under rapid transformation. The third one is to investigate and understand the dynamic and the static state of the complicated relationship in the urban eco-system. The fourth one is to search for alternative models for eco-policy development in this region.

We want to carry out the following four tasks. The first one requires the urban development state data, development data and environmental data since 1978, including physical or natural data- air, water, solid waste, energy, transportation and geographical data, economic data, industrial production data. They are structure, output, efficiency, land use, technology and infrastructure. Social data, population, institution, policy making, consumption and human tradition should be considered too. The second one is to identify the risks and opportunities for future development. We will identify its driving force from natural resources, financial resources, the citizens' behavior and institutional power and also dynamic process. They are material and energy flow.

I think urban environmental problems are caused by the inefficient use of material and energy when you produce fewer products but use more materials from the environment. The environment will be exhausted if you get too much from the eco-system and put in only a little. For example, the soil or mine, this cause exhausting, so we will study exhausting process and positive and negative effect from system's point of view, immigration of the people moving from rural areas to cities and from cities to other cities. Especially in the area during the past

20 years about 8 million people from hinterland moved to this area, especially to town and city areas. The third one is to identify key factors, limiting factors, and promoting factors to discover its opportunities and risks. And finally, symbiotic relationship, competition, symbiosis and self- reliance, these are three types of economical symbiotic. We should identify and evaluate this mechanism. Then the third one is to access the responses of the urban eco-complex. We think the whole city is a social economic nature complex eco-system. It is physical, air, water, biology, soil. This is the first physical subject. The second is agriculture, industry, rural city transportation, landscape. The third one is the human society, the technology, institution and behavior. Our task is to connect these three levels through time, space, processes, structure and function to study its mechanism and its dynamics.

Figure 2 Human Ecological Impacts and Responses



So the main cause is urbanization and industrialization. It caused ecological stress on its function, service, influence and we should study its responses and risks. So here we will study its relevance from time, space, quantity, structure and function order, these five factors. And to study its eco-system, responses, especially those indicators; one is economical efficiency and future potential and ecological services; function and its Eco common, Eco assets. These people do not think about it in this area. They just think about ecological output, not ecological service function and also social effectiveness. So in this third one we should study relevance and responses. The fourth one is to study its Eco-police strategic, Eco-city, Eco-human settlement strategies and models. We will find some strategies for Eco-process monitoring for institutional reform, for legislation enforcement, for technological innovation and for behavior endorsement. The second one is Eco-police models. Many have concentrated on these aspects. Try to find some Eco-industry in this area, try to form a new kind of Eco-police, try to change the people's behavior to form the ecological culture and make some ecological community.

Next, the research method and instruments. We are working in this area in relation to another project. We also use monitoring to set up a GIS database in this area and we will also do some field surveys and social questionnaires. Most data will come from existing information, some other reports and existing references. Also, industrial ecology is one important method in this project. Ecological economics, evaluation, ecological engineering and a small project are part of our method too, in our capacities and research experience. We have finished in the past two years two national science foundation projects. One is the Eco-strategies of rapid town development in South Jiangsu province from 1994 to 1996. Another is ecological economic evaluation for the economic development zone in the Yangtzi River Delta. This was also finished last year. Another two key national science foundation research projects are going on. We will carry them out next

year. One is the environmental change of urbanization and its impacts on Eco-city in the Yangtzi River Delta. This project started this year and it will be done by 2002. Another one is the ecological service function and its regulation strategies of urbanization in Yangtzi River Delta. We will start it from next January and also we are carrying on two state science technology key projects. One is a comprehensive experimental community for sustainable development in Changzhou City and Huazhuang in Wuxi City and Jiangyin County. This city, which is to in the north of Wuxi City might provide some data and information and the government is cooperating with us. We also have some time to study strategies for sustainable technology in small and middle size town development through the ecological engineering in this area. Also there are a lot of other projects we have already finished in the university and research institute.

As for local involvement, there are a lot of universities in this area. For example Fudan University, Nanjing University and East China Normal University were involved in our projects, for example providing some guest professors. I organized a cooperative research project through coordinating three universities. We also cooperated with two institutes at Nanjing. One is the Research Institute for Geography and the other is for soil science. They have a lot of work to do. We have good cooperation in these areas, among these institutes, our environmental science research center and local government in Changzhou, Wuxi, Suzhou, Jiangyin, Changshu, Fuzhuang and Wuxian. We have a very good cooperation relationship with them. Some of our research members had been working with them in different areas. So we can get some information with their support. Finally, for our expected results, one is to prepare the database of the target city in an environment and development field and to prepare a background report. The second one is to prepare the environment and development review report. Third one is the integrative settlement of an urban ecological complex. This will be published in some international journals. The fourth one is the Eco-policy and Eco-industry development strategies and recommendations provided for the local government. Also we will train some Ph.D. and masters students.

From now on, we will spend three months identifying our project sites. May be in this meeting we will decide which city or which group of cities we will focus on and study from this summer. We will finish the data collection and analysis and collect some policy data and also do some policy analysis to make some assessments, some studies which are connected with the whole project. We hope to continue the comparative studies with Japanese colleagues to get more results.

Discussion

Prof. Imura

We have already had three presentations by three Chinese experts who are in charge of the three case studies. So in their presentations they explained pretty

well the rationale of selecting these three cities as case study cities in China. In terms of geographical conditions, industrial structure, development of economics and environmental situation and so forth, all these three cities have very important features. And all these three can be representatives of features.

And also with respect to the Shanghai area, our intention is not to take up Shanghai City itself. It is a very large, complex city but rather we will take up a smaller city in this area. This Shanghai area is one of the most important regions in China in terms of its economical development, etc.

I was surprised that this area has a population of 73, almost 74 million. It is a very large area. It is a mix of rural and urban areas. According to the explanation by Prof. Wang it is a similar area to Tokyo, Nagoya and Osaka. It means it is very important for China. And now I would like to ask the opinion of the participants, your comments or suggestions about what kind of studies we should undertake starting from these presentations by these three experts. I just noticed that they have some common basis. But still there are some differences concerning their framework. Maybe we need more elaboration about the framework. We should have common basis. Also we should have data of some optional or additional elements taking into consideration the characteristics of respective cities or regions. Prof. Shi rightly pointed out the necessity of some indicators to compare the situation of the different cities. I think that we need some quantitative data, such as air quality or water quality. These data can be expressed in a quantitative way. Sometimes these indicators or some index demonstrate the other state of the environment. Not only in terms of physical concentration but the rural administrative governance, and management labor. For example what kind of human resources each city has, or how many environment experts in each city has demonstrated their policy priorities or something like that. And Prof. Wang presented very advanced ideas about urban global policies. He presented ideas about eco-policy, eco-complex and so forth. We used eco-policy in Japan. But there may be similar ideas, and there may be differences. We should elaborate more on the concept of eco-policy or eco-industrial development. For example, Kitakyushu has possibilities of being an eco-town. Now do you have questions or comments?

Dr. Bai

I would like to briefly introduce the results of a small group meeting with our Chinese group. Because we had arguments about features of Dalian City this morning. We held the meeting in order to find out what is the most important feature of each city so that we can avoid the duplication of studies among three cities. So, we reached some kind of common understanding which is basically that in Shenzhen City we should focus on rapid urbanization and also the open policy of our country. This one also includes environmental policy. And also Shenzhen City is the first city in which the tertiary industries dominate the city's economy. So we will focus on several factors in the Shenzhen case study. And concerning Dalian there was some misunderstanding of this feature written in the case study guideline, the document 5. But what I meant by this planned

economy dominated by government is that Dalian City has very large industries, which are mainly owned by the government. These industries are gradually changing to other types of industry. And also they have a lot of heavy industries. But it does not mean that Dalian City is not a beautiful city. Please do not misunderstand that point. And in Dalian City we would like to focus on the study of open development management and infrastructure. Dalian City has a very long history of development. It has very good environmental infrastructure compared to the other two case study cities. Therefore this infrastructure part will be mainly conducted in Dalian City. And also Dalian City has many state-owned enterprises. And these enterprises are gradually changing into market economy enterprises. This is also a very important part of the industrial transformation. So in the Dalian case study we will focus on these three. Concerning the Shanghai area as Prof. Wang has just mentioned, village and township enterprises are developing very quickly, for example the rural urbanization, land use change, water pollution and high population density etc. In the Shanghai area we will focus on the effects of the village and township enterprises development on environment and ecosystems. And we may include some rural urbanization and land use change parts in this case study area. And most of us also agreed to add some ecological aspects to this study, because this will become the basis of our policy recommendation.

Prof. Imura

Thank you Dr. Bai for your nice description about the different conditions of three cities and areas. I myself am not well informed about the Chinese economy. But I trust what she has just mentioned. According to her explanation, there are good reasons for us to take up these Chinese cities as our case study subjects. And I would like to ask just one more question about the Shanghai area. Prof. Wang expressed his intention to take up several case study cities, and the area itself is very large so I would like you to be more specific about how you intend to choose cities. Because if we had a very large budget, we could cover large areas. But our budget is very limited, so at the first stage we should take up only a few cities. Do you have any ideas about this?

Prof. Wang

For the case study we should choose one city, for example Changzhou or Wuxi. In these two cities we have very good cooperation with the local government. Changzhou is a comprehensive, experimental community for sustainable development. And Wuxi also has some small towns controlled by Wuxi. These are also a kind of experimental community. But for the first case study we will choose Changzhou. For the second case study we should have more resources and time to make some comparative studies.

Prof. Imura

I am not very familiar with the geography of the Shanghai area. I just have a quick question. What is the population of Changzhou City?

Prof. Wang

The population is about 0.9 million. In China 0.9 million is a little bit smaller than Shanghai.

Prof. Imura

Prof. Wang has presented very important ideas about the analysis. Now we may adapt the PSR model. P means pressure. S means state. R means response. P is sometimes called driving force. In all case studies we should identify the driving forces or pressures which caused change of urbanization, environmental changes, economical development or industrial policy and so forth. So we need some description about what the driving forces are in the area. And we need some description about the state, the environmental state. Then we need some policy information: what kind of action is taken? What kind of administrative system, mechanism, or technical measures should be adopted in this situation? So I think that the PSR model will be a useful framework for analysis. This is what I thought when I listened to the presentation of Prof. Wang. And in the Shanghai area case study we will take up the role of town, village enterprises and rural-urban interaction. I think that is a very important element in our study. Otherwise we would just take up large industrialized cities. If we included that kind of different type of cities, we would make our study more fruitful. Thank you for your contribution. Any other comments?

Prof. Soerjani

I agree that the study of very big cities like Tokyo or Jakarta is very difficult. I am suggesting that Shanghai is a big metropolis That is also a feature of cities in Indonesia. At the beginning we will study the surrounding system of big cities. Because many small cities surrounding big cities may influence also unmanageable big cities. For example, Jakarta, because it is too big to study. The data of Jakarta is very important. But we should take up the small cities surrounding Jakarta to study it in more detail.

Prof. Imura

Thank you Prof. Soerjani. When we have completed a study in the Shanghai area and the Jakarta area, we may have some comparisons. There may be some similarities. It is a good idea.

As far as indicators are concerned, we need some elaboration. After this

meeting I would like to ask some of you to prepare guidelines of indicators. And I hope to collect as much data as possible according to this guideline.

Dr. Jeong

I think OECD developed very good sustainable development indicators. So we can apply these indicators and hand them out to all case study teams and collect data according to these indicators.

Prof. Imura

I know that OECD developed sustainable indicators. But I have a question about the availability of data. We will prepare the format of the indicators.

Dr. Jeong

I can copy them and send them to you.

Prof. Imura

I would appreciate that. We can bring in some ideas or format. At the same time we should pay attention to the availability of data. Anyway we very much appreciate the contribution by Dr. Jeong.

Prof. Soerjani

When we look into these urban development indicators, we have to be careful about the sustainability of indicators. Because there are some sustainable indicators, we can compare these and get relevant information.

Prof. Imura

We should be careful about the sustainability of indicators.

Prof. Katsuhara

My question is concerned with rather institutional data. To be more concrete, financial capability according to Prof. Imura's guideline. Financial capability and suitable technology being taken into consideration, instead of a larger type of technology, a smaller type would be desirable. This sort of rather institutional or technological data should be collected or evaluated for analysis, particularly in China or Indonesia.

Prof. Imura

I agree with your comments. Especially in rural areas, we should carefully analyze the appropriateness of technology. And in the Shanghai area you take up some township and village enterprises. There are diversified industries in the Jakarta area and a large population. In these cases we may discover more appropriate technological options. I am not sure what kind of technology will be available. But we should seek some different options. Prof. Wang mentioned symbiosis between the eco-community and industries, what kind of technology will support eco-industry and eco-community? This kind of question should be very important. With respect to financing mechanism, we need money to improve our environment. So what kind of financial mechanisms are available in respective regions? Sometimes there is government support, or enterprises find financial sources themselves, or industries from abroad bring in money.

Prof. Soerjani

It was mentioned that one of the projects in China includes students. What is your policy in this case?

Prof. Imura

It depends upon each case study leader. If he has good student resources, why should he not use them? We do not have special arrangements for giving them special money. We should just draw up a contract with the case study leaders. Then within this budget you may do whatever you want to. In your case if you find good student resources, you can utilize them as you like.

Dr. Jeong

I have some recommendations about the case study in China. In the Dalian case, I understand that they use good relocation programs to reduce the pollution issue. You can evaluate the outcomes of the relocation policy. By judging the transport of pollution from the central city to the outside world they can reduce real amounts of the pollutants. In the case of Shenzhen and Shanghai, I guess that there might be compounds between Hong Kong and Shenzhen, Shanghai and surrounding rural governments. So I want to know how they can handle the issues and what kind of system they have.

Prof. Imura

As far as Dalian City is concerned, the policy is to relocate industries from old cities to new industrial areas. So Dalian City has a very advanced industrial zone outside the old city. It is important to study the relocation policy. It did not relocate polluting industries from the city center to the outside. When we move polluting industries to the outside, there will be some renewal of facilities. New

facilities have better equipment, which contributes to modernization of technologies and cleaning up of the environment.

As you pointed out, one city cannot exist by itself. There is always some interaction with other cities. For example Shenzhen and Hong Kong, Shanghai and the surrounding cities. We will concentrate on one city, but we have to pay attention to interaction with other cities. In the Dalian case, there is an international link with Kitakyushu or Japan. As far as I know, in the 80's Japanese industries moved their facilities to the northern part of China (Cement industries, machine industries). In the 90's many electronics companies moved their facilities to Shenzhen or the Guangdong province. This kind of international interaction is also very important for urban development.

Prof. Soerjani

You mentioned relocation of industries. We should not forget that relocation of industries mean relocation of people. If you move industries to rural areas, you move the people working in the industries. Of course, pollution also moves. But industries create more jobs. This includes the development of this area. It is important for sustainability of this area.

Prof. Imura

According to the experiences of Japan, the industrialization process causes great migration of the population. This is one important reason why we have industrialization and urbanization at the same time. It is easy to say scrapped and built. For that we have to move population from that side to this side. It is not easy. Also there are many township enterprises. Many of them are polluting industries. If you shut down this polluting industry, many workers will lose their jobs.

Prof. Wang

In the Dalian case study we have to concentrate on industrial transformation from a state-owned economy to a market economy. In the Shanghai area it is very important to study transformation from a rural area to an urban area. This causes a large amount of immigration to urban areas, changes from farmers to workers and very severe environmental problems. In this area we can see Chinese style modernization. In Shenzhen we will study the combination of western style and Chinese style modernization because of its location near Hong Kong. Hong Kong has already returned to China, but its life style is capitalist. Some people still believe that modernization means western style modernization in industrialized countries. But I think this cannot be used in developing countries. So we should study the transformation including culture, lifestyle, consumption behavior etc.

Prof. Imura

We are looking at the possibility of joining IHDP-IT program. It has not yet been decided. As you mentioned, Chinese style modernization processes and industrial transformation in China may have some specialties. We may find it a good model for industrialization in East Asia. There have also been nice comments about Chinese cities. We can have a clear image of the differences among the three cities and areas. We can make more detailed comparative studies of these different cities, and we can have more fruitful results.

Prof. Shi

I agree with Prof. Wang about what you mentioned but I want to add some comments. First, we have to define in different cities one or two driving forces of urbanization. In Shanghai and Dalian, industrialization caused urbanization. But in Shenzhen urbanization came first. We can see different driving forces in these cities. Secondly regarding indicators. 1,Phisical, ecological indicators. 2, Social 3. Economical, 4. Environmental quality indicators. By using these we can compare different cities or areas. We need groups to discuss in more detail the indicators based on different scientific backgrounds.

Prof. Imura

OECD has developed indicators in the framework of driving forces, state, and response. But this is for states not for cities. So we have to modify these indicators and think up our own indicators.

Prof. Ukita

Now in Japan there are two key points. One is symbiosis, recycling, and circulation. In that sense I would like to ask Prof. Wang about the image of eco-industry. Could you please explain it?

Prof. Wang

We have been working with some local eco-industry in our study. At first they had a type of assessment using life cycle assessment. Based on these assessments we tried to combine different factories to industrial complexes to make full use of the resources. At the same time we are creating more working opportunities. Now China faces problems of unemployment. So we are trying to create more job opportunities in our urban ecological industry study. Industry produces not only products but also survices. For example, car industries produce not only cars but also traffic survices. In one case study in Changzhou City, we studied the urban solid waste problem. We combined government and enterprises to reduce amounts of garbage and try to form new industries like garbage treatment machines. Through these we can create three times the number of

working places and also give garbage positive profit. But this is just starting. We hope to cooperate with Japanese companies.

Prof. Imura

We will talk about this later.

Prof. Ukita

We had better focus on two aspects to think about environmental indicators. For example, we are thinking about recycling water. In that case we must reconsider the importance of water management.

Prof. Imura

We will use some smaller cities surrounded by rural areas as case study cities. And in these we will focus on material recycling or water resources. I think we should elaborate on technical questions. So we would ask for the collaboration of Prof. Ukita to elaborate on the data concerning this question.

Korean Case Study

Ulsan Case Study

Presented by Prof. Deokho Cho (Kyongju University, Korea)

I.The Goals of This Research

1. Background of This Research

East-Asian Countries have experienced rapid economic growth, industrialization, and urbanization. This also created severe environmental problems at the local, national, and even global levels. And then, the current economic growth policy reaches some limitations environmentally in sustaining economic growth. Therefore the goals of this research are to find a new paradigm for sustainable development economically, socially, and environmentally in this area and to suggest a new direction of economic development for the developing countries.

Korea has influenced the economic growth of East Asian countries because she is one of the most successful countries in terms of economic development. In another way she has been experiencing very serious environmental problems due to the negative impacts of rapid economic growth. She recently changed her growth strategy from economic growth to sustainable development in order to solve environmental problems. Therefore Korean experiences will be helpful in solving environmental problems of other Asian countries.

2. Scope of This Research

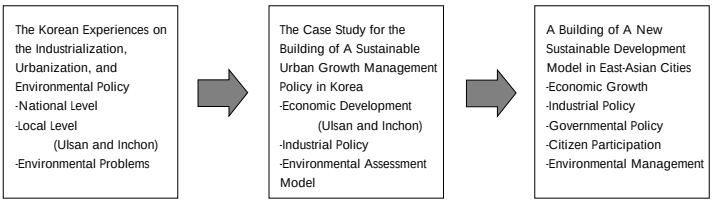
This research covers the Korean economic growth policy in macro system and incentive structure. Based upon this policy, it notes Ulsan's and Inchon's industrialization process, more specifically, the building of industrial complexes for economic growth. We go to the second scope. It examines the urbanization process at national and local levels and it identifies a relationship between economic growth and environmental pollution. It also contains the urban environmental problems in Ulsan and Inchon. It indicates the national environmental policies and those of specific cities. It also reviews a turning point from economic growth policy to environmental protection policy. We have to turn to the environmental protection policy. It's a very important policy. It will finally build a new model on sustainable urban growth management for solving the environmental problems in East-Asian Cities.

3. The Goal of This Research

Based upon the above research, it will develop a model of sustainable urban growth management policy for the East-Asian sustainable urban development policy. The flow chart of this research shows the Korean experiences of

industrialization, urbanization, and environmental policy. There are environmental problems at national level and local revel. Why is it at national level and local level? In 1990-1995, the central government controlled every thing. But from 1995, policy started to change dramatically. Central government gave autonomy to local governments. We will also carry out a case study for the building of sustainable urban growth management policy in Korean economic development, industrial policy and the environmental assessment model. Particularly, in the case of Ulsan. Ulsan is a symbol of organization, industrialization and environmental problems. Finally, we will look at the building of a new sustainable development model in East-Asian cities, including economic growth, industrial policy and governmental policy, and citizen participation. Citizen participation is very important, because of the importance of opinion in environmental management.

Figure 1 The Flow Chart of This Research



II. The Content and Method of Research

1. Contents of Research

Transformation of the industrial structure in Korea. There is the central government level, the local government level and the industrial level. The Industrial level concerns a case study on particular manufacturing plants in Ulsan and Inchon. Prof. Imura and Dr. Bai have already come to Korea for the Korean case study and reviewed urban environmental policy. The urban environment includes air quality, solid waste, management of water quality, and also urban infrastructure includes energy, road and other environment related social capital. And as far as urban environmental policy, we will review environment related law, planning, organization and fund resources. Based upon the review of research, we will go to field survey. Field survey reviews environmental policy of specific cities: Ulsan and Inchon, and surveys on environmental problems of specific cities such as air quality, solid waste, management of water quality, and so on. There will be study of the role of government, social organizations, and citizens. Finally, there will be the building of a sustainable urban growth management model. Economic growth policy and urban amenity and industrial ecology and sustainable consumption and the role of organizations: government, social organizations and citizens. Finally we will go to international comparisons of the environmental

and economic growth policy. We are going to compare environmental policy and economic growth policy between Japan, Korean, China and Indonesia.

2. Research Methods

There will be a field survey on urban environmental problems, industrial complexes, and environmental facilities. Secondly, there will be statistical analysis based on questionnaires of government officers or experts. And finally, there will be a GIS mapping of the environmental problems and monitoring systems.

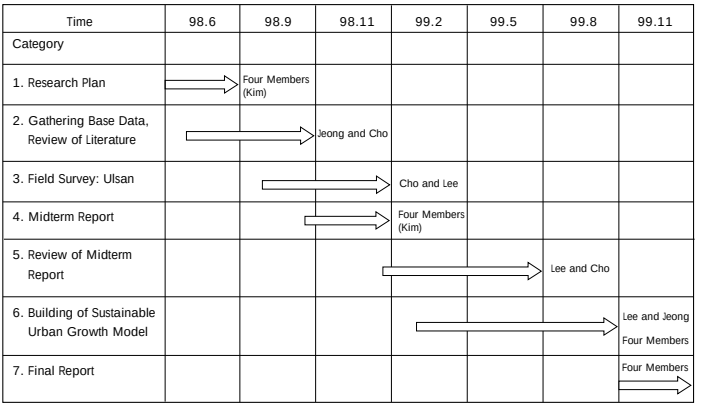
III. Research Members

I would like to introduce research members here (see Figure 2). We can send you more detailed information by e-mail and telephone.

IV. Time Schedule of Study and Members' Roles

We will follow the schedule of the described signpost here (see Figure 2). The case study team consists of 4 people, who have different roles respectively. This study is based on the overall research framework of IGES.

Figure 2 Time Schedule of Study and Member's Roles



This is a map of the location of the Ulsan industry complexes. The red color shows national industry complexes. Other industry complexes are local industry complexes. The green color shows rural industrialized complexes. We have three different industrialized complexes. One is the national industrialized complex. Another is the local industrial complex. The third one is the rural industrial

complex located in rural areas. The problem is that national industrialized complexes are controlled by the central government, even if they are located in local areas. And so two different systems control two different industrialized complexes. The environmental protection criteria are different at national level and local level. It's a problem. Furthermore, until 1995, the central government controlled everything, but recently infrastructure has changed from central authoritarian government to local autonomy. Everything changed very quickly in just 40 years. Korea was a poor country. We joined the OECD program. Unfortunately, we also joined the IMF program. Ulsan is the typical example of the Korean problem: organization, industrialization, economic growth, and urban environmental problems. But recently, the Ulsan government changed the industrial structure. At the beginning there were mainly heavy chemical automobile industries such as ship-building (ex: Hyundai is a car industry). Now the structure is changing from a heavy industrial structure to electronics or high technology in order to control the environmental problem. This is a broad map of the location of Ulsan complexes. Ulsan is basically located in the south-east part of the Korean peninsula. Another case study is Inchon. Inchon is located in the Korean peninsula near China. These are two different large case study areas. Ulsan has its own role, but in the case of Inchon, the policy is directly metropolitan. Also Ulsan is very close to Japan and Inchon is very close to China. I would like to finish my presentation here. Thank you very much.

Discussion

Prof. Imura

Thank you very much Prof. Cho. Do you have any comments or questions about his presentation? Prof. Bai and I visited Ulsan City a month ago. I noted a number of similarities between Japanese industrial cities and Ulsan City. The situation in Ulsan City reminded me the situation in Kawasaki City, which is a city with much heavy industry. And Kitakyushu City was the same about 20 years ago. So I think there are some similarities between the experience of Japan and that of Korea. They have been thinking up new possibilities so far. There is a change of policy from economy oriented policy to environment oriented policy taking place. So this form of case study in Korea may be very important and very useful. Questions or comments are welcome.

Prof. Katsuhara

Inchon is the sister city of Kitakyushu City. My impression is that there is a big difference between Inchon and Ulsan in terms of the industrial structure. In Inchon there is a very big JL-industry, which is very close to Japan's Mitsubishi heavy industry. This of the JL-industry includes electric industry, rolling industry

and energy intensive industry which cause pollution. But in the case of Ulsan, there are mainly industries, such as the automobile industry and also the ship-building industry. What do you think about the difference of industrial structure that causes pollution?

Prof. Cho

Basically, Ulsan and Inchon have heavy industries. At the national level Korean industry has changed from light industry to heavy industry with economic growth in 1972-1990. Specifically Ulsan has car and ship-building industries. But the main industry is still heavy chemical industry. So pollution problems still remain. But in the case of Inchon, like all other cities in Korea, several different industries mix together and several different pollutants are created. Ulsan is an exactly planned city. New organization and new industrialization present totally different characteristics of the city and a totally different structure. But Ulsan has a huge industrial complex. The difficulty is that there is a very old city. So the situation and industrial structure of the old city and that of the new city are different.

Dr. Jeong

Industries of Inchon are developed by government relocation. Many industries from metropolitan areas moved into the Inchon area. And in the case of the Ulsan industrial complex, the first industrial area that was developed was textile chemical industry. And then the automobile and ship-building industries developed and grew. Pollution problems of the two cities are quite different. In the Ulsan area the most serious pollution issues are VOC pollution, water and ocean pollution. But in the case of Inchon the most serious issues are TSP pollution and then sulfur-dioxide concentration because they have heavy industries which need a lot of energy. These are the differences. The methodology of organization is quite different. Inchon lies in the east gate of Seoul. So it has followed the growth of a metropolitan area. But in the case of Ulsan, export oriented economy developed. That's the difference.

Prof. Imura

At present, Korea is in a time of transition, not only of economic policy but also environmental policy. They are shifting from central government oriented policy to new decentralization, as Prof. Cho mentioned. The citizen's participation movement is taking place. It's a new phenomenon in the country. There is world environmental management here. In Japan the environmental management system is based on ISO 14000. It's also a very important management. Korea will introduce this system. When I examined Shenzhen, I was surprised to find that Shenzhen City has established an ISO 14000 registration office.

Dr. Jeong

Concerning points mentioned by Dr. Imura, I would like to say something. Environmental movement in the Ulsan area began by protest by residents in environmentally dangerous areas against polluting firms. In mid 1970, the government decided to relocate residents from Ulsan and industry complexes to other places. This happened in mid 1980. So the central government gave some power to local governments. Environmental issues gave rise to a quite different economic condition. So the local government took some initiatives after the introduction of an autonomy system. That's the reason we want to compare the environmental situation before and after the introduction of the local autonomy system. Environmental management is a big issue, as Dr. Imura mentioned concerning ISO 14000. But we already have this system. And then our government introduced designated environmental friendly firms, and then they gave some kind of discretion to environmental movement action. But most firms involved in the program are large firms. However, we have also many small industries, so we have problems dealing with medium and small industries, which cause pollution. We need to and will pay attention to giving small and medium industries motives to join this program.

Prof. Imura

Thank you very much. You mentioned health risk problems. We had a long discussion with Prof. Shi from Shenzhen about people's perception of health risks. In Japan we had very serious incidents. We had many health problems caused by air pollution and water pollution. I have the impression that in China they are very concerned about it but there is so many difference in people's perception, recognition about what the health risks are of environmental pollution. There may be a comparative study among cities about people's responses to the possible environmental risks in different countries. Any other comments?

Prof. Shi

I want to add to what you mentioned about bio-diversity. How far in your proposal do you include bio-diversity? I think that these two cities are different in bio-diversity. You mentioned the economical indicators and social indicators but not as much about physical, eco-system, or eco-city indicators. Different areas have a different environmental capacity. I hope that we can add bio-diversity.

Prof. Cho

In order to save time, I skipped a lot of things. Ulsan is a metropolitan city and a nice city. That it is metropolitan means that more than one million people live in the Ulsan area. In 1997 Ulsan suddenly became a metropolitan city. In the table you can see special information covering several areas, such as the social

economy and even social organization. The political structure has changed. I would like to ask your opinion. The presentation itself was short, but with a lot of content.

Dr. Jeong

Originally the Ulsan area had very good diversity in the early 1960's. It was one of the good diversified spots. But during industrialization we lost almost all of these diversities, many different kinds of species are lost, especially fishes. I wonder if now we can find original data on the bio diversity in the early years. I imagine that it will be very hard job to complete.

Prof. Imura

Thank you very much for your comments. We will take into account in comments made in this meeting. And then they will add more elaboration to implement action on the Korean case study.

Indonesian Case Study

Tangenang Case Study

Presented by Prof. Mohamad Soerjani (Institute for Environmental Education and Development, Indonesia)

Introduction

1. I reformulated this proposal prepared for the second work shop according to Prof. Imura's guidelines with some modifications but without spoiling his ideas.

2. The keyword of the Indonesian case study is sustainable development. In Indonesia development itself is very important. If development is sustained by components/factors, these components should be good. We try to see the translation of Indonesia from the point of view of sustainable development.

3. Indonesia has three different regions (west, east, central) and also three different biological resources. Eastern part is influenced by Australian biological capacity. The western part is influenced by Asian biological capacity. And the central part is a combination of the above two parts.

Not only the biological component, but also tribes and languages are diverse in these three areas. Therefore it is a very difficult situation for development. But Indonesian people are still optimistic that Indonesia will develop one day through proper environmental management.

4. The environmental system dichotomies

There are distinct dichotomies. Among these I took four components.

-natural - man-made

-poor - rich

-urban - rural system

-sustainable development-unsustainable development

The approach of the case study addressed is to see how these dichotomies should be overcome.

5.About methodology

The environmental problem is very complicated, and sometimes confusing. To identify and to understand the environmental problems requires broad knowledge. Based on this understanding, the priority in our action should be determined. Then we will look into this specific city, Jakarta and

Figure 1 Three Phases of Indonesian Case Study

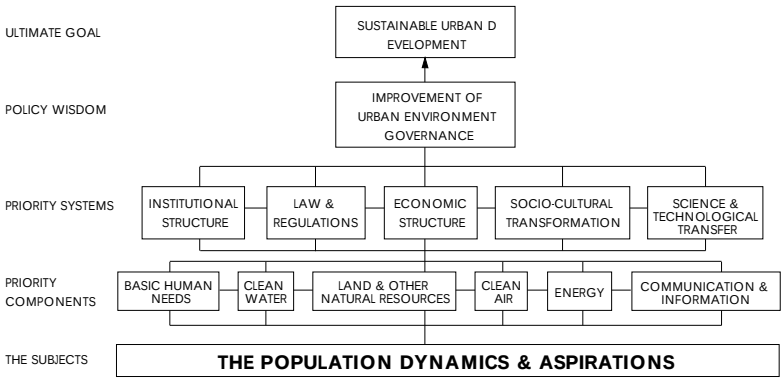
Phase I : 1998-1999:	**URBAN ENVIRONMENTAL PROFILE IN INDONESIA** The case study of Tangerang, a suburban of Jakarta.
Phase II : 1999-2000:	**URBAN POTENTIAL SUSTAINABLE DEVELOPMENT** To include other cities in other parts of Indonesia, the study will cover the harmony of urban development with the sustaining environment, and appropriate mitigation of environmental impacts and risks of industrialization.
Phase III : 2000-2001:	**URBAN SUSTAINABLE DEVELOPMENT MODEL** Based on the synthesize and comparative analysis with the results of the case studies in other cities in Asia, this phase will formulate alternatives of governance policy, infrastructure, socio-cultural and economic system and technological innovations.

its suburb Tangerang. Jakarta has at least three suburban areas: Bogor, Tangerang and Bukashi. Jakarta is a crucial area of Japtape (Jakarta, Bogor, Tangerang, and Bukashi).

We have to do our case study according to the objectives and methodology submitted by Prof. Imura, but we can still discuss about methodology. So Prof. Soerjani gave some suggestions. (See Figure 1)

Phase 1 is to describe the present urban environmental profile of Indonesia and the case study of Tangerang, suburban Jakarta. We must learn from environmental experiences of Japan, Korea, and China and make the best use of comparative advantages of the joint research. Phase 2 is to seek for strategies in order to improve present profile toward a more sustainable urban development including surrounding cities and islands. We cannot concentrate only on looking at sustainable development in Jawa. So far, one problem has been that everything is centralized in Jawa. This causes social, cultural, and economic problems. Phase 3 is that based on the synthesis and comparative analysis of joint research not only in other cities of Indonesia but in other cities of Asia as well we will formulate alternatives of governance policy, infrastructure, socio-cultural and economic systems and technological innovations. Concerning technology we should not concentrate only on the high-tech but should try to provide opportunities for the appropriate technology to local people (small, medium industry). Small and medium industries are sometimes more effective than high-tech for local people. We have to be careful that sustainable development should involve more people.

Figure 2 Scope of Indonesian Case Stud



The scope of the case study showing that through transformation of various factor (components, systems and wisdom), the urban environment governance may facilitate the sustainable urban development (modified from Imura 1998:6)

6. I would like to present our project's ultimate goal. (See Figure 2) The ultimate goal is achieved by policy wisdom. Policy wisdom is influenced by a priority system (Institutional structure; law and regulations; economic structure; socio-cultural transformation; science and technological transfer from Japan,

U.S.A, and Europe). These are interrelated. These systems consist of components such as basic human needs, clean water, and the obtainment of policy transparency through communication and information. These are not objectives but tactics to get sustainable development. Development should be supported by not only parts of a people but also by the entire population.

Indonesian case study

At the first phase of comparative analysis we should know past Indonesian urban history, recognize present successes and failures and discuss what the future urban model should be? We should study and draw lessons from Japan, Korea and China. Through this comparative analysis we can modify our future urban model. With this refined urban model in mind, in the second phase we can establish the urban environment sustainable development model. This urban environment-sustainable development model will be changed according to local conditions and characteristics. The application of this model to Indonesian cities should be done in the third phase.

1. The expected results of the first phase study are:

* The description of an urban environment development with a comparative advantage with other urban case studies.

* The demonstration of innovative potential and model of the urban sustainable development relevant to the local and the Asian conditions.

* The identification of possible interaction and transfer of experience and technology from successful urban sustainable development policy and practices in other cities in Asia.

* The establishment of network among cities in Asia for a better future sustainable urban development.

2. Schedule

Start with data compilation and reports and add data from local field works

September: First progress report

January: Draft final report

February: Second project group meeting

The important thing is that the schedule needs to be combined with other research in order to compare with other case studies.

Natural and man-made dichotomy

We can see that the man-made environment increases from 25% to 32.5% in a comparison between the present condition and that of 1990. There is a conflict between the intention of forest conservation and the demand of development.

This is because some people believe that by cutting down all of the forest we will attain very high GDP growth.

Rural and urban system dichotomy

In exploiting environmental resources the urban system will absorb a great deal of resources and leave the rural only limited ones. Urban people will live under better conditions than local people. Of course there is certain support from the urban to the rural community, but in fact the urban community exploits the rural community. This creates social unrest and criminality, which affects both the urban and rural eco-systems. Jawa is a good example of this case. Resources came from other islands: Smatra and Calimantan. The people of Jawa benefit from manufacturing goods. This creates social inequity.

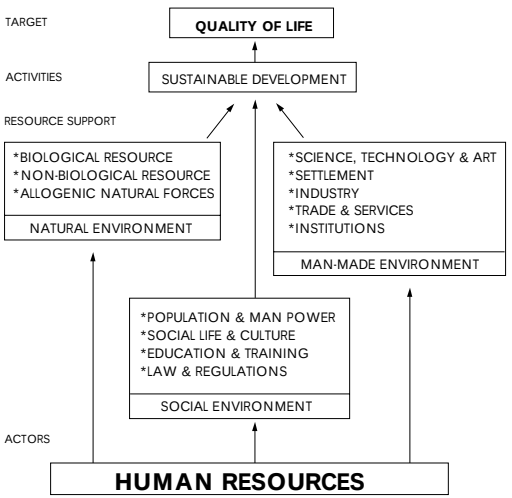
Poor and rich dichotomy

A study of the Asian development bank suggests that poverty is created by unsustainable development.

Sustainable development and quality of Life

Shown in Figure 3

Figure 3 Sustainable Development and Quality of Life



Sustainable development implemented by the human resource through the management and support of environmental resources as appropriate.

This exactly follows the definition of the World Commission on Environment and Development. Sustainable development improves the quality of life. Sustainable development is supported by natural, man-made, social environment.

Quality of life as a target of development

Quality of life is measured by;

-Increase of life expectancy

-The alleviation of poverty

-Intellectual life and skilled manpower

-Equal and appropriate participation in the process

Sustainable development and unsustainable development

I cannot fully agree with this study. But we can see why Indonesia is not sustainable. The reason is because of the depreciation of natural capital of GDP. This study shows that Japan is highly sustainable. Japan's net savings are 20% and her depreciation of natural capital is only 2%. I suggest that the reason for this is that Japan imports raw materials and puts a lot of added values into resources. Therefore I suggest that the rural community around the urban system should not cultivate rice and fruits but should put added values on resources. Sustainability can not be calculated in dollars. This benchmark of sustainability in Pierce & Atkinson's opinion is based on financial or economic values. But we also have to take intangible values (employment, health, education etc.) into consideration.

The situation of Indonesia

The number of small cities and towns is 106. Cities with autonomous or administrative status are 52 and other towns serving as important district capital cities are 27. About Jakarta. Jakarta has over 10million people who need clean water, energy, and food but produce effluent, solid wastes, and emissions. Jakarta is not a mature community from the ecological point of view. We can see social imbalance between Jakarta and Indonesia in education, job opportunity, and economic growth. In fact, Jakarta politically and economically guides Indonesia but we should not forget that there are other cities in Indonesia. Jakarta is surrounded by three suburban areas. We can see how Jakarta expanded into these three suburban areas which it exploits.

This is the reason for why we have to do a case study of Tangerang. This city is at the center of complex industries (steel factories, textile factories, paper factories). But there are also smaller industries. And in some of these areas agriculture is done. People who cultivate were resettled and relocated to provide

land for industries. In rural areas people produce small flowers. It costs only 150 rupee. When it comes to sophisticated factories, the price will be 1500 rupees. So I suggested that the farmers own these factories by themselves. Appropriate technology should be introduced to the farmers. But added value is not produced by one department. It is produced by networks. This is the network of support from not only Indonesia but also from Japan, Korea, China etc. A network is beneficial for everyone who is a member of the network.

Discussion

Prof. Imura

I thank you for presenting a number of ideas and nice models explaining the core issues and problems of Indonesia. Especially you presented the study framework, which is based on the model of four dichotomies. But unfortunately I am not an expert of Indonesian issues. So I would like to ask experts of economic as well as environmental issues in Indonesia like Prof. Yamashita, Prof. Shinohara and Prof. Hayase to make comments.

Prof. Yamashita

I think that Prof. Soerjani's idea is very comprehensive overall. But if we take time limitation into account, I would like to know which aspects Prof. Soerjani is most concerned with in your today's presentation.

Prof. Soerjani

I did not mention which ones specifically. I think that the better way is to select two or three issues among those which I proposed. But I would like to tell you that establishing a model of sustainable development is very important. Otherwise the whole system will be destroyed.

Of course we will have to see about environmental laws, environmental institutes, development institutes, etc. We can see these from data related to component, which Prof. Imura mentioned. So we can use full of these the data and analyze them for a case study.

Prof. Imura

The framework which Prof. Soerjani proposed is excellent. I think that we still need to collect relevant data and hope that he will present more concrete conclusions based on this proposal.

Prof. Hayase

I would like to put emphasis on the idea of Prof. Soerjani shown in Figure 11. He mentioned priority components and priority systems. These components and systems are very important. In collecting data and information in each case study, these items need to be covered.

Prof. Imura

Based on the data shown by Prof. Soerjani, Indonesia is an agricultural country (56% of its products are agricultural). Therefore, the situation of Indonesia is different from that of other countries. The urbanization of Indonesia is taking place in this kind of agriculturally dominant country. So we may notice some differences in processes between Indonesia and other countries. Nevertheless we can notice similarities between the Jakarta area and the Shanghai area. As Prof. Soerjani mentioned, cities cannot survive by themselves but are supported by other cities, or islands. This element is very important when we undertake our case studies. We focus our attention on cities, but those cities cannot exist by themselves, but are dependent upon the outside world. Prof. Soerjani also presented an excellent idea about the definition of sustainability (Shown in Figure7, 9). Please conduct Indonesian case studies in cooperation with other researchers based on these ideas.

Prof. Wang

I thank you for giving us good information about your project. But in many cities it is difficult to collect data and obtain the cooperation of local people. I would like to know how you get information and cooperation from local governments, research institutes, and industries. We chose not only the Shanghai area but also some suburban areas far away from rural areas to get some different kinds of data meeting the demands of this project. In Jakarta will you collect only statistical data and reports or will you make a research survey? I am very interested in a comparison between Shanghai and Jakarta.

Prof. Soerjani

In fact I admit that this is a problem. I would like to explain why I took Tangerang as an example of different aspects of an urban environment. The reason is: 1. Tangerang influences Jakarta and is influenced by Jakarta. So, seeing the relationship between Jakarta and Tangerang is very important. 2. Tangerang was once created as a Kotamanrere, Southport city of Jakarta. Development started in the industrial cities and created satellite cities. Then, people who worked in industries came to live in Tangerang. A hotel, supermarket, school, and university were made in Tangerang and people who lived in Jakarta came to Tangerang to save time and reduce transportation. But Tangerang is not totally successful. There

are still people who work in Jakarta, but live in Tangerang because houses are cheaper there. So there are still people who commute to Jakarta.

Prof. Wang

How far is it from Jakarta to Tangerang?

Prof. Soerjani

Tangerang is itself 25-30 km away from Jakarta. I think that sustainability should be used as a key word to analyze data. There are people who benefited from development and people who did not. Some people buy land for one dollar. But some developers buy the same land for 1000 dollars. Who befits from this? It takes a lot of time to judge who gets benefits from development. So we try to see certain action programs. We will get some information from application of the idea of sustainability. Even in forest exploitations there is merit. People around the forest should be paid by the company which exploits the forest. But this does not truly happen, because most people are cheated. I would like to turn your attention to another five words. These are refuse, reconsideration, re-use, recycle, and respect. Reconsideration means looking for better alternatives. Recycle comes after re-use. If a camera is broken in a technology-developing country, people buy new one. But we can repair it instead of buying a new camera. Buying a new camera helps economic growth. So replacement helps economic growth but on the other hand creates serious problem. Respect means to respect each other and your decisions, so this is an essential aspect of democracy. Of course you blame us for not having democracy. It is possible to see a relationship between democracy and environmental matters. If you can see democracy through monopoly, through the proper distribution of opportunities, you can see environmental problems. But do not forget that it is difficult to reduce the cost to environment. It is not easy, because this seems like a tragedy of the common. And we tend to think that we do not have to pay for that.

Prof. Wang

I think that your works are to concentrate on the relationship between suburban Jakarta and Jakarta itself. Not concentrating on Jakarta alone.

Prof. Soerjani

The macro environmental system of Jakarta has to be seen. It is suitable to collect information about population (immigration to / from Jakarta). One of my ideas is that there is urbanization and also ruralization. Because people feel affected in cities, there are a number of people who relocate to rural areas.

Japanese Case Study

Kitakyushu Case Study : Environmental issues and the development of industry and urban areas in Kitakyushu City

Presented by Prof. Takeshi Katsuhara
(University of East Asia, Japan)

At the last meeting I explained the history of Kitakyushu development. In a nutshell, Kitakyushu was doomed to develop based upon the basic raw material industries like Yahata Steel Works established in 1901, when the United States Steel merger occurred in the United States. After the war, Japan, especially Kitakyushu City underwent big structural changes, including changes to industrial structure, an energy revolution and a technological revolution. Also the new tendency that is called "sense of value", appeared and changed greatly among the general public, and with such kind of things in mind, I want to say "draw out" this material.

1 The environmental control

1.1 1960's - 1970's

* Severe industrial pollution occurred.
* After frictions in the initial stage, consultations between administration and firms bore fruit in the so-called Kitakyushu City Model.
* As a result, concerted action was taken between enterprises and the administration, reducing pollution dramatically.

1.2 1970's -

* Urbanization and the popularized car caused the Urban Type Pollution.

1.3 1980's -

* People became increasingly aware of the Importance of Global Environmental Issues, which led to "Kitakyushu Agenda 21" implemented in 1996.

1.4 1990's -

* A new challenge started in the quest for "Zero Emissions and a Recycle Society." More concretely, Kitakyushu is now tackling an ambitious Eco-Town Project
* International Environmental Cooperation on a local-to-local basis is being actively implemented by Kitakyushu, making use of the most accumulated pollution control technologies and human resources.

Included among these is "the Dalian Environmental Model Zone Project

2 The Causes of the Environmental Pollution

2.1 Industrial Pollution

* High economic growth, together with prevalent thought of "Projection First"
* Energy-intensive basic raw material industry led the local industrialization
* Shifting of energy use from coal to oil inevitably increased SO_2 emissions

2.2 Urban Type Pollution

* DID (Densely Inhabited District) and residential area expanded
* Diffusion of cars and consumer durables, combined with higher living standards, and changes in life styles
* Insufficient urban infrastructure, such as roads, sewerage and parks, etc

3 The State of the Environmental Pollution

The notorious seven-colored smoke, which was formerly a symbol of prosperity Air and water pollution markedly intensified in high growth period (1955-1970)

3.1 Air Pollution

* Dust fall (Shiroyama Area)
  - 80tons / km^2 / m (max. 108), 1965; The worst record in Japan (47tons, 1970, 14tons, 1975)
* SO_2
  - 0.04ppm(average) ,1969 (0.005ppm, 1979)
* NOx
  - 0.03ppm(average), 1973 (0.02ppm, 1979)

3.2 Water Pollution

* Dokai Bay surrounded by factories was polluted with untreated domestic and industrial waste that contained harmful substances
* Such being the case, the bay was once called "The Sea of Death", COD 36mg / l, DO 0mg / l

3.3 Murasaki River

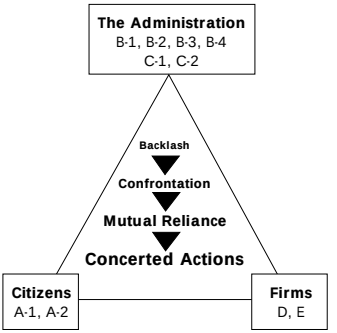
* BOD 26.11ppm downstream, 1966

4 The Responses to the Environmental Pollution

Three leading players responded respectively in distinctive ways as shown in the following.

The interplay between the players bore fruit at last in a successful model after getting over difficulties. (Refer to the conceptual diagram "Kitakyushu City Model": Figure 1)

Figure 1 Kitakyushu City Model



4.1 The citizens:

As early as the 1950's, the pioneering activities of a women's group of Tobata ward started and contributed directly to the initiation of the Pollution Prevention Campaign with the slogan "We want our Blue Skies Back", which started in 1965. (Refer to Women and the Environment, Kitakyushu Forum on Asia Women, 1995) Among others is included the "Murasaki River Cleanup" Movement.

4.2 The Municipality:

* Environmental management system improved;

  - Pollution Control Bureau set up (1971)

  - Air Pollution Monitoring Center established, and Smog Warning System started (1970)

  - The Institute of Environmental Sciences established

  - Administrative guidance intensified after the enactment of pollution-related laws by the "Pollution Diet" in 1970, and municipal pollution countermeasures were implemented in a comprehensive, systematic and steady way.

  - Pollution Control Communication Councils established

These councils were a unique and efficacious cooperative system between firms and administration, characteristic of the Kyushu Model.

* The Legal System reinforced

  - Kitakyushu Pollution Control Ordinance enforced (1972)

The Pollution Control Agreement on SO_2 to complement laws and the municipal ordinance concluded with 54 local businesses (1972)

* The urban infrastructure improved (sewerage, roads, parks etc.)

* Relocation of noisy small factories to newly-built industrial parks promoted

4.3 The Firms:

* In-house Pollution Control System consolidated

The corporate organizations and management system were improved

* Technological Countermeasures taken

- Replacing oil by L. S. Oil, LPG and LNG was most cost-effective.
- Cleaner production technology was, so to speak, a trump card.
- End-of Pipe treatment technology was expensive, but many big companies dared to install flue gas desulfurization equipment etc.

Figure 2 Specific Traits of Kitakyushu City Model

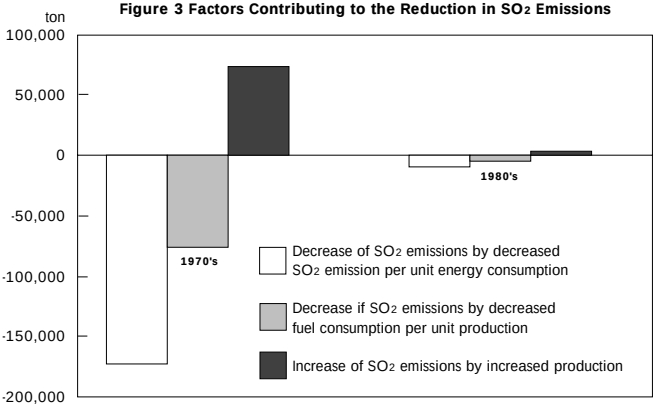
Players	Items
Citizens	A. 1. Citizens anti-pollution movement supported by mass media 2. Murasaki River cleanup movement
The Administration	B. Environmental management system 1. Influential administrative guidance based on scientific demonstrations 2. The crucial role of "pollution control communication council" 3. "Smog alarm issue" enabled the people to know pollution state, forcing the firms to take agile actions 4. Implementation of effective city planning; * Improvement of the urban infrastructure * Relocation of the noisy factories to newly-built industrial parks promoted
The Administration	C. Controlling methods 1. Command and control (Laws, the municipal ordinance) 2. Complementary "pollution abatement agreements" between the city and local firms
Firms	D. The corporate moralities existed in the once agreed, they must abide by it.
Firms	E. Pollution control technologies 1. The shift to clean energy reduced SO_2 emissions significantly 2. Cleaner production technology also contributed to SO_2 Emissions reduction

5 Specific Traits of the Kitakyushu City Model (See Figure 2)

5.1 Pollution Control Technology (See Figure 3)

* The shift to clean energy had a dominant impact on SO_2 emissions reduction

Figure 3 Factors Contributing to the Reduction in SO_2 Emissions



* Cleaner production technology also contributed effectively to SO_2 emissions reduction

* End-of-Pipe Treatment Technology played a supplementary role

5.2 Controlling Methods

* Relying distinctively on "Command and Control" by-laws and municipal ordinances

* Complementary "Pollution Control Agreement" between the city and local firms, however, played an important role from the practical point of view

5.3 Environmental Management System

* Powerful municipal guidance based on scientific demonstrations; Administration asked the firms to reduce SOx, use low sulfur fuels, and furthermore to make a SOx reduction plan, giving them administrative guidance on matters such as fuel conversion

* The crucial role of "Pollution Control Liaison Council" for communication between the City and the Firms

* The announcement of Smog Warning enabled people to get pollution information beforehand, facing the firms to take their countermeasures quickly

* Promotion of Effective City Planning;

    -Improvement of the Urban Infrastructure

    -Forced relocation of the noisy to newly-built industrial parks

As part of city planning, the separation of factories from residential areas was implemented

5.4 In addition to law-abiding behaviors, corporate moralities themselves existed in that, once agreed, they believed that they must faithfully observe it. (The existence of Corporate Compliance Mind and Mortality)

6 The advent of a New Era: A Big Challenge for Kitakyushu City to face approaching the 21st Century

6.1 Socioeconomic changes

What does the future have in store for us? God only knows the answer. Despite that, Japan is surely heading for a New Era; Information & Communication, and Aging and Globalization will be the main features of the coming society. Furthermore, people's sense of value is also changing more for the amenities of urban life combined with quality of life.

6.2 "Vision of Kitakyushu Renaissance"

With the aforementioned socioeconomic changes in mind, Kitakyushu City

has already conceived a "Vision of the Kitakyushu Renaissance" for 1988-2003. In a nutshell, the Vision consists of the following Five Targets for the Future;

* A city of high quality amenities blending greenery and waterfronts
* A city of welfare and culture where citizens can enjoy a healthy and enriched life
* An international city of technology that will generate and promote industries of the future
* A booming city with its door open wide to the sea
* An Asia science and research city that will clear a path to the future

6.3 The Direction of Town Creation

* The Balanced Development of Asia in total
* Bringing together the functions of commerce, convention and administration in the center of the city (Kokurakita ward) and in the secondary center (Kurosaki ward).
* The city has been divided into nine zones.

6.4 The Major Projects (Refer to the attached sheet)

* Construction of the New Kitakyushu Airport which will be opened in 2005
* Promotion Plan for Hibikinada as the Hub Port for the Pan Yellow Sea Area
* Construction of East Kyushu Expressway from Kitakyushu to Kagoshima
* Preparations for the Kitakyushu Science and Research City
* Murasaki River "My town, my river" Development Project
* Kokura Station North Exit Area Development Project (ex. Asia-Import Mart, West Japan General Exhibition Center, the Accumulation of Commercial, Business, and Service functions and Facilities)

6.5 The Strategy for promoting the Environmental Industry in Kitakyushu

The environmental industry will surely play a crucial role in implementation of environmental policy and also in creating a new growth industry as a vanguard to revitalize the industrial base.

Based on such thought, a comprehensive strategy was established from the following three viewpoints;

* Consolidation of Educational Base and Basic Research
* Promotion of Environmental Industry, Technical Development and Demonstration Research
* Promotion of International Environmental Cooperation

In line with the above, "The Eco-Town Project" has just started in Kitakyushu

The gigantic project aims at building an ambitious Recycling Society, and consists of the establishment of Environmental Industry, the incubation of New Advanced Technology and the invitation of the Environmental Engineering Department of Universities.

Comments

Prof. Imura

Thank you Prof. Katsuhara for your comprehensive presentation of the environmental improvement model of Kitakyushu City. Because of time constraints, he could not mention details of the different aspects of the Kitakyushu's new efforts such as the Eco-town project. As far as I understand, concerning air pollution, the key technology or countermeasure was the introduction of natural gas. In the early 1970s, the industries of the city made a long-term contact with Indonesian energy companies, that they may introduce natural gas from Indonesia that makes the air of the city clean. In respect to water, the sewage system plays a very important role. We should notice that even in an industrialized country like Japan, we started to construct the sewage system in the middle of 1960s, and before that, there had been no sewage system in Japan. We have a very short history of a sewage system. But during these periods, what amount of money did we spend? It is gigantic amount of money which has been spent on the sewage system. Prof. Katsuhara also mentioned administrative aspects; he talked about the roles of citizens, enterprises and the government. I think that the models of cooperative interaction between these actors which he showed might be useful information derived from his presentation.

Ube Case Study: Later Progress of the UBE Model, other than Air Pollution Control

Presented by Prof. Masao Ukita
(Yamaguchi University, Japan)

1 Introduction

The Ube Model might be called the Prof. Nose Model in a sense, because his strong leadership and influences played a key role in controlling environment pollution not only in Ube but also in other cities in the Yamaguchi prefecture. Shown on page 1 and 2, the Ube Model could be divided into three periods from 1949 to the present.

1.1 The 1st period

The first period goes until the end of the 1960s. Air pollution was successfully

controlled in this period.

1.2 The 2nd period

The 2nd period is from 1970 to 1992 in which there are perhaps three topics: water quality problem, noisy airport problem and golf link development project.

1.3 The 3rd period

The 3rd perio commenced with the start of the environmental council after the resignation of Chairman Prof. Nose. Leadership changed generations from Prof. Nose to Prof. Nakanishi.

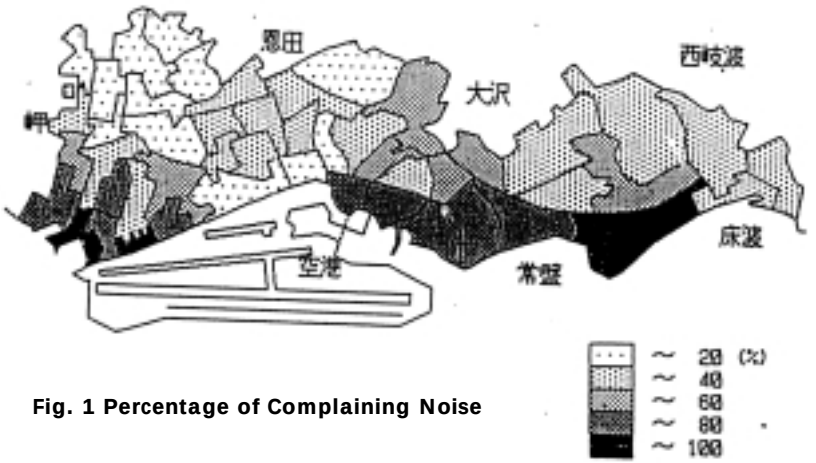


Fig. 1 Percentage of Complaining Noise

2 Airport Noise Problem

2.1 Background:

Yamaguchi Ube airport was opened in 1966 with a 1200 m long runway and a total area of 50 ha. It provided service only for a YS11 flight at that time. The runway had to be extended to 2000 m and the total area to 122 ha so that the Jetliner could be introduced.

2.2 Problem:

The noise problem became the main issue and the environmental council paid much attention to it.

2.3 Works of study group:

* noise survey

* investigation of influences of airplane noise

* investigation using Corel Medical Index (CMI)

2.4 Effective countermeasures (following the proposals by the study group):

* Flight route change

* Greening of airport

* Facilities construction for recreation and sports

* Sound-proof house work.

2.5 Result:

* 4 round-trip flights a day from Ube to Tokyo and similarly 4 flights a week to Sapporo and 3 flights a week to Okinawa using the Jetliner system started in 1986.

* In 1995, the EIA request for extension of the airport to 2500 m runway was submitted to the environmental council and checked by the committee members carefully. This project is now under construction

2.6 Experience:

* Awareness and serious concern for inhabitants' health

* Careful studies and effective countermeasures

3 Golf Link Development Issues

3.1 Background:

10 years before, in the same time of the Bubble era, two plans for a golf link development arose in Ube City around Ono Lake where the water source of Ube City is located. This plan was launched to attract young generation to live in Ono district and to succeed their land.

3.2 Problem:

* Lawn management could cause fertilizer and pesticide pollution to water resources and its influence could affect human health.

3.3 Main events relating to the golf link development issue:

* Oct. 1988, a developer submitted to Ube City a consultation document for development of the Lake Ono Country Club Golf Link

* Dec. 1989, Another developer submitted to Ube City the consultation document for the development of the Fujigouchi Golf Club

* Nov. 1991, Fujigouchi G.C submitted the EIA preparatory document to Yamaguchi Pref., Ube City and Onoda City. Ube City requested the Council to evaluate the EIA.

* Dec. 1991, an academic expert meeting was organized. The questionnaire

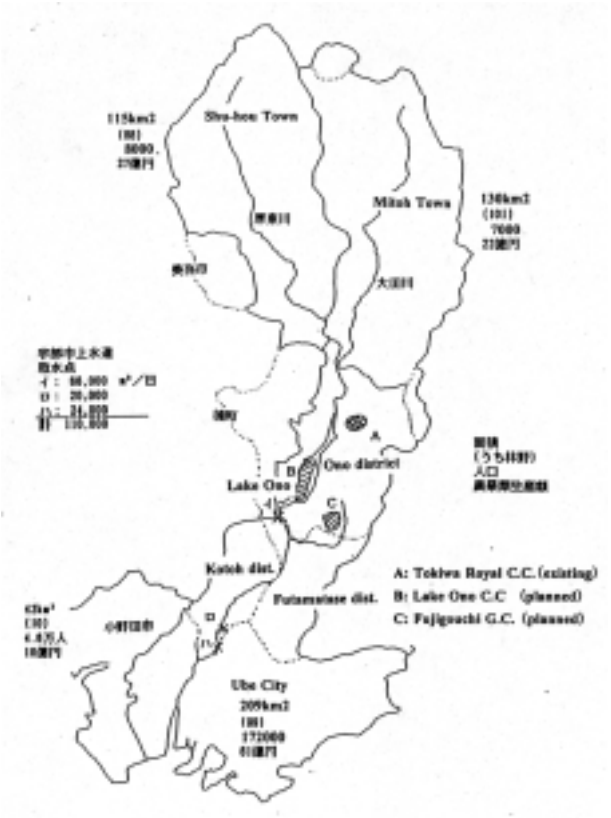


Fig. 2 Golf Link Development and Water Resource Areas in Ube

survey was conducted and the result showed over 80% citizens against these projects.

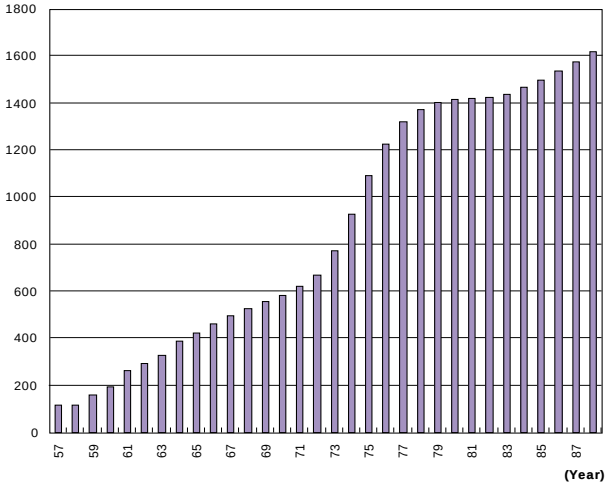
* The Council of environmental pollution control denied the project.

* Aug. and Oct. 1992, Lake Ono C.C and Fujigouchi G.C submitted the EIA preparatory document to the prefecture and the city. Lawn management without using pesticides was proposed.

* Mayor Nakamura changed his position from being against these projects to agreement in a highly political consideration.

* Feb. 1993 to Mar.1993, a citizen network for the recall movement was established, including technical committee to evaluate the EIAs. The teaching staff of the Medical School of Yamaguchi University submitted to the

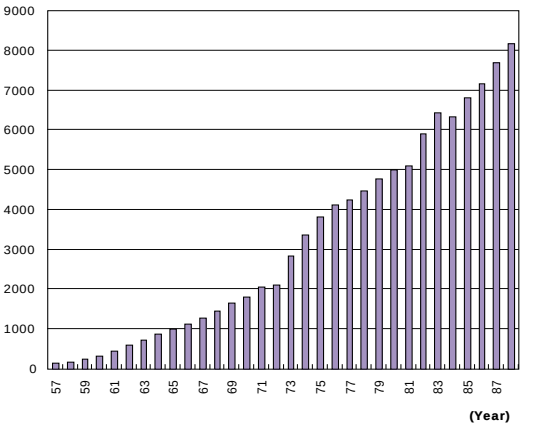
Figure 3 Number of Golf Links in Japan



assignment. The governor declared his strong intention to seek for substitute for pesticide.

* May 1993, Lake Ono C.C and Fujigouchi G.C resigned their projects.

Figure 4
Number of Players visited Golf Links in Japan (ten thousand)



3.4 Reasons to oppose these projects:

* Prof. Nose focused on the long-term deterioration of geographical and soil property in the Kotoh river Basin.
* Pesticide pollution and its influence on human health
* Construction of golf links would not be effective for the true activation of the planned area (The author's idea)

3.5 Reason why the project was stopped (successful experience):

* Prof. Nose's belief that water quality of Kotoh river had declined from the standpoint of public health

* Staff of the Medical school appealed with many evidences

* Strong activities of the citizen's movement

* The Council of environmental pollution control is open to mass media and principally to citizens also, so that citizens could join the meeting together with the mass media as observers, especially at important events. This might have the effect of making the committee members stricter.

Discussion

Prof. Imura

Thank you Prof. Ukita for your very comprehensive report on the Ube environmental situation. We may draw several important lessons from his speech. I could note several important points. For example, in Japan, especially in Ube City, the role of medical doctors was very important as Prof. Ukita mentioned with Prof. Nose. He was a medical doctor and his specialty was public health and epidemiology. First, in our history of environmental management, medical doctors played a very important role in issuing an alarm about the health risks of environmental pollution. That was a very important element for advancement of our environmental policy. Second, the Japanese style of environmental decision making depends on forming some consensus among local residents, governments and academic people and so forth about some projects. So, from the Ube study, you may draw some lessons about this kind of social consensus building or methodology in typical Japanese cities.

Prof. Yamashita

I am very much concerned about the transfer of environmental technologies from developed countries to developing countries. And I'd like to point out the necessity to pay attention to the role of city government and also citizen in this process. The Kitakyushu and Ube model introduced by Prof. Katsuhara and Prof. Ukita are important and useful examples for us to understand. We should be concerned with the practical measures for effective transfer of environmental technology. We should pay attention to the practices and practical training of government officers and citizens, and even the activities of private companies. I think that the Kitakyushu and Ube model are good examples of this. Secondly, as we have time and budgetary constraints, we should concentrate our efforts on the strategic field of study. I will give one example: The relation between the process of urbanization and pollution; and we are going to find the solution for this. In this problem, we had better learn from the kind of model of Kitakyushu and Ube first, but only models and written materials are not so useful. We need to work together with experienced city governments. My proposal is that we need to study inter-city cooperation among two or more countries. This is one of the effective ways to transfer environmental technology. Therefore, I propose to consider the possibility and effectiveness of city cooperation among two or more

countries. If we agree that it is useful, we'd better find a specific field of study and field of cooperation between countries. Then, as Prof. Katsuhara has already mentioned, local initiative is very important. We'd better learn from the experiences of local cities like Kitakyushu and Ube. I recommend for you to study more deeply, and why don't we put this into practical use.

Prof. Imura

Thanks Prof. Yamashita for your important comment on promoting more facilities for inter-city cooperation. I wish that our study will be helpful for the facilitation of this kind of cooperation. Thus, we are now asking for the participation of various cities. Then this cooperation or collaboration, as we know, will be good bases for further development of such inter-city cooperation. Especially in Kitakyushu City, they have a good deal of experiences with technology transfer, pollution control, cleaner production technology and so forth. Together with Kitakyushu City, Ube City was awarded the global 500 prize by UNEP, therefore it can provide successful experiences to other cities by joining the project. So Ube City has the good experiences and this should be transferred to other countries. And we have not made good effort in making their experiences a universal one. That was one important motive for Ube City's participation in our exercise. Based on their experience, they will produce some reports and make efforts to transfer their experiences to other countries. And this will contribute to inter-city cooperation between different cities and countries.

Dr. Xia

I thank these two professors who made excellent introductions about their research proposals and the experiences of Kitakyushu and Ube City. Last year, I went to Ube City to attend the conference. As I know, both cities are typical, going from a severely polluted city to a clean city. These cities have both received the global 500 Prize of UNEP. So the experiences and lessons are somehow worth learning by other cities, especially in developing countries. One of the most useful experiences of these cities is the combination of activities taken by the government, public citizens, scientists and firms. All of these groups make efforts together to control environment problems. As I mention these facts, I feel deeply that in China and other developing countries, this method is not an easy way, because there are always some conflicts of interests between these sides. What public citizens want to do is not what enterprises want to do. How to combine all these viewpoints and integrate them is not an easy task. I hope that in your case study, you can make full and deep research about this mechanism.

Final discussion

Final discussion on the Research Plan of FY1998 and Case Study Guideline

Chairperson (Prof. Imura)

Now we are going to start the final discussion on the Research Plan of FY1998 and the Case Study Guideline.

Prof. Soerjani

I'd like to mention two things. The first one is the transformation of environmental technology mentioned by Prof. Yamashita. Developing countries, when they learn of the experiences of developed countries, sometimes make mistakes. If we transfer technology, we should look ahead because environmental risks are also transferred with technology at the same time. The environmental impact caused by a certain technology is different between developing countries and developed countries. Therefore risk assessment is very important. The second one is networking. Not only networking among ourselves, but also releasing the outputs of our case studies to the public such as local governments, NGOs, universities and so forth, is very important. If it is possible, we may have local workshops to develop such networking.

Chairperson

Thanks to Prof. Soerjani for mentioning the transformation of environmental technology and networking, and also for the suggestion of holding some local workshops. Maybe, when we complete our study in one or two years, we can collect our outputs and sometime we may present our research outputs to other people from local governments to NGOs and so forth. And we may also hold this kind of meeting other countries. This idea is in my mind.

Prof. Soerjani

I would like to hold a meeting not only at the final stage of result but also within the process.

Chairperson

I am not sure when we will hold that kind of meeting, but I will take it into consideration when thinking about the future program and project. Dr. Xia has rightly made very relevant comments about our Japanese case study. Maybe we should study in more detail the mechanisms of our environmental decision making. What kind of mechanisms worked for Japanese successes in conquering

environmental problems in the past?

We know something about it but we should explain it in universal language, otherwise foreign people cannot understand. So we need a little bit more elaboration on this point about the Japanese case study.

According to this Agenda I would like to conclude this meeting. Before that we should summarize the important aspects of discussion which we made. We have several questions about the case study guideline. We do not have enough time to conclude a definite case study guideline. So I would like to ask Dr. Bai to modify her idea of how to deal with the case study guideline. Maybe she would like to make a revision.

Dr. Bai

Actually, we planned to modify and finalize this document before you leave. But I do not know if it is possible or not, because it depends on how many comments we will receive from you. So I will briefly talk about my own idea of how to modify this case study guideline. The first point is of course that I have to add Japanese case study cities into the document. I am sorry for those missing.

And the second is that I would like to change the expression and specify some parts of the Chinese case study in quoting the results of our small group meeting after lunch. The result is about the background data. Here some persons suggested that we should include ecological aspects in this background data. So maybe we should add some ecological factors, such as flora, fauna, and something related to ecosystem, but I do not know how to say it, or how to find out the indicators for this ecosystem. The ecosystem part also includes something on eco-capacity.

And the third modification will be to add indicators as the base for comparative studies. Otherwise we will have no common bases for comparison in the comparative study.

My idea is that we can add some indicators, such as physical and geographical indicators. The second type is a social indicator. The third is economic indicators, the fourth is environmental indicators, the fifth is institutional indicators (This one means how large of a budget you have, how much manpower you can use for environmental monitoring or control), and the last one will be ecological indicators (such as flora fauna, eco-diversity and eco-capacity). The last part, by which I mean the indicator part, was only briefly sorted in this guideline Document. A detailed plan of this will be developed later in cooperation with Prof. Hayase and some other key members of this research team. If you have any other suggestions or comments, do not hesitate to give them to me now or later.

Chairperson

Thank you Dr. Bai for your summary. She rightly took up many comments

which you made. She made very comprehensive comments. I do not think that it is wise to expand the limitation of our study, and she mentioned a number of indicators. But we should pick out the most important, meaningful indicators. Otherwise only the data collection will be heavy, large work. Considering the limitations of budget and time we should find out the most important key elements of each case study city.

We should focus on the most important key elements for respective cities, otherwise we would undertake very broad and large studies but our results will not be fascinating for general people, especially for policy makers.

At the same time we should be aware of the necessity for our study to have some academic value. We are researchers, so our research outcome should have some academic value. But at the same time we should emphasize the role of our studies. It should be very policy-oriented, strategic output.

About the schedule.

We have to elaborate the schedule. I am not very sure of the exact schedule of our excursion. We would like to visit the case study cities in summer, autumn and even winter.

Before that we would like to make a consultation with the case study leaders about detailed contents: the organization of research teams, financial arrangements, etc. So in this meeting we will not make any formal decisions. But tonight or tomorrow, as long as you are staying in Kitakyushu City, we would like contact each participant of this meeting, especially case study leaders, about future arrangements including the case study contents, who participates in the studies, etc.

Dr. Xia

We would like to confirm one point. Prof. Imura told us that we have to pay attention to specific topics, or special characteristics of each city. If I talk about Dalian City, we should pay much attention to the construction of environmental infrastructure, the environmental management system, and industrial transformation. If we talk about these topics clearly, we will succeed. Let me confirm it.

Chairperson

That is almost what I mentioned. The first reason for this is that out budget is limited. It will be difficult for us to undertake completely new studies. We should utilize the existing materials as much as possible. Then we should focus on some specific or very important aspects of cities. Of course, if a lot of existing materials are available, then we can make an analysis utilizing these materials. But still we should focus on some key points. As you mentioned in the case of Dalian, maybe you can find some important aspects. In Kitakyushu City, eco-technology or its

management system is very important. So, you may identify the most specific, important elements of each case study city. That is my intention.

Dr. Bai

I would like to add one point. Our case study consists of two parts. The first part is the background report. This part consists of collecting all existing data and research materials. In this part we hope that our case study team can cover at least the four subjects which are proposed in Prof. Imura's research plan. The second part is to conduct the case study. In this part we would like you to concentrate on one, two or three particular problems and conduct new research.

Chairperson

Her comment was very clear. Any questions?

Prof. Yamashita

About the data collection, I think that it is better to select the indicators.

Otherwise one group will collect this data and the others will collect different data. It is not so useful. So hopefully you may show us a systematic way of data collection.

Dr. Bai

We are going to develop it later.

Chairperson

We have already talked about it during the coffee break. I asked Prof. Hayase to join in this work together with Dr. Bai to prepare some indicators. Then we would like to show this result as soon as possible.

Prof. Hayase

I support the effort in making a draft on the basic set of data. My understanding is that this background data should be limited to the minimum set of required data for each case study team, because there are many kinds of data. If all case study teams must collect all the data, it would be very laborious. We should make clear a minimum set of required data for comparison. This is my idea.

Dr. Bai

I think that maybe we can set a minimum set and a maximum set, because we would be very delighted to have as much information as possible.

Chairperson

If there is a number of reliable existing data we can utilize that. But even if there is a grate amount of data, the most important data might be lacking. We should avoid this situation. So we should at least define some minimum of the most important data. Sometime, even though some data is very important, it is difficult to collect that data, because in some cases the data is lacking. In that case we should ask the case study team to make a very large effort to collect entirely specific, core data. If there is much existing data, we will utilize those data. About the schedule. The next meeting of this group will be held some time in February or March of next year. We would like to ask you to participate in this meeting. The place will be at IGES headquarters. But it has not been decided yet. Tomorrow an open symposium will be held. You can get new information at the open symposium. In the afternoon open symposium and IHDP-IT meeting will be held simultaneously. You can choose which one you would like to attend.

information

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