Urban Environmental Management Project

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1. Overview of the project

1.1. Background/objectives

At the beginning of the Third Phase, the Urban Environmental Management Project (UE Project) planned to carry out strategic research on air, solid waste and other key cross-cutting issues for the purpose of evaluating and recommending strategies with the goal to enhance the knowledge base of policy makers and other stakeholders and to guide them towards developing sound urban environmental strategies.

However, the project plan was suspended after the Second Phase peer review meeting on 22-24 June 2004. The peer review panel, composed of three external experts, assessing both research and administrative aspects of the UE project over the period of 2001-2004, recommended that a major restructuring and refocusing should be performed as an *ex ante* precondition to the Third Phase project research. The panel unanimously suggested that the UE project plan be reformulated on the basis of a clear research plan with a conceptual framework, hypotheses and methodology corresponding to the available resources, and suggested that all UE research funding be suspended until the project leader and the project team produced a clear and focused research proposal. However, several months having passed, the project had still failed to submit the required “clear and focused research proposal” and the project leader resigned to take responsibility towards the end of fiscal year 2004.

After the resignation of the project leader, Prof. Morishima took on the role of acting project leader and the project went through restructuring procedures. Taking into consideration the expertise of the researchers, time constraints, and the severity of the impacts on the urban environment, it was decided to focus the research solely on two urban environmental areas, namely, (a) air pollution control in the transportation sector, and (b) improvement of solid waste management. The revised research plan for the Third Phase was thus developed focusing on those two issues and endorsed by the Members of the Board in June 2005.

The goal of the restructured UE project was to contribute towards the better management of the urban environment in Asian cities by developing new ideas and tools, analysing various factors that facilitate the formulation and implementation of policies, and evaluating their limitations and advantages. Many cities in Asia have not been able to solve urban environmental issues on their own due to lack of capacities, finance, and technologies. To fully address those issues, it is not sufficient to make these cities solely accountable and it is necessary to involve other stakeholders such as national governments and the global community. The project’s decision to focus on strategies to link local issues with global issues, specifically mitigation of greenhouse gases (GHGs) came as a breakthrough.

Thus, under the theme of “integrating global concerns into urban environmental management in Asia”, researches were conducted on the two aforementioned issues. The transportation research team focused on the field of reduction of travel activities and promotion of modal shifts, which are the two major strategies that simultaneously reduce both local pollutants and GHGs. In the area of solid

waste management, various aspects of 5R (the Reduce, Reuse and Recycle initiative plus Recover and Residue management) were addressed, including policies towards a circular economy, treatment technology change, and source separation.

1.2. Methodology

The overarching research questions of the project are: “What are the opportunities created by bringing ‘the global to the local’ and what are the barriers (technical, financial, institutional etc.,)?” and “How should we approach key policy options and make them happen?” In this project, these questions were visited repeatedly, but from different viewpoints for the two strategic target areas. To answer the above questions, case studies were conducted in Asian cities by utilising various methodologies.

a. Case cities and methodologies used in the Transportation Research

[Researches related to reduction of travel activities]

Those researches addressed reduction of travel demand through urban planning in the context of air quality control and GHG mitigation. In the past, this area had not been taken into account fully as the other types of policy measures such as emission control and fuel change had been highlighted in Asia. Nowadays, however, growing attention is paid to the impacts of urban planning in the developed world.

The methodologies used in these studies include quantitative analysis and qualitative analysis. The quantitative parts include finding whether the three kinds of policy measures, namely, dense, mixed use, and pedestrian and non-motorised transport (NMT) -friendly urban design, are significantly correlated to air quality and GHG emissions from transportation of a city through statistical testing. These three traits were chosen as they are relatively widespread in Asia. Qualitative analysis includes case studies in three large cities in Asia, namely, Yokohama, Shanghai, and Bangkok. Those cities were chosen because they experienced problems caused by emissions from the transport sector and possess relatively ample data on these issues. The studies in Bangkok and Shanghai were commissioned to local experts.

[Researches related to modal share]

Asian cities are now experiencing rapid motorisation and policy intervention against this trend to secure a higher take-up of public transport is imperative in order to limit the exponential growth of emissions of air pollutants and GHGs from the increasing number of automobiles. Policy measures on modal share include development of public transport, control of vehicle usage, and promotion of NMT. For each of these policy measures, the project identified a case study city. In the area of public transport, Jakarta was chosen because it introduced the first exclusive Bus Rapid Transit (BRT) system in Asia and contributed to the improvement in modal share. For vehicle restraining policies, Beijing was selected since it has an urgent need for vehicle restraining policies as it is facing a rapid growth of vehicles and car dependency is higher than in other Chinese cities. The case study on NMT was conducted in Mumbai due to its high potential for the introduction of NMT, since roads are generally wide and could accommodate the construction of NMT which could be an effective measure to provide access to an already well-developed public transport system. In addition, in the area of public transport, a comparative study was conducted on the policy processes to introduce

BRT and three cities that started to adopt BRT in 2004, namely, Jakarta, Seoul, and Beijing were chosen as the case studies.

The case studies in Jakarta and Beijing, conducted by commissioned researchers, qualitatively analysed factors that impede or facilitate the policies for modal shift by examining the local information related to current situation of policies, their background, and effects. The case study in Mumbai conducted multi-criteria analysis to evaluate the selected policy measures that were identified through personal interviews and consultation with actor groups. The comparative study on BRT policies employed qualitative analysis of the roles of actors and factors that facilitated the lesson-learning processes based on local newspaper review and expert surveys.

To secure the quality of those transport studies, two workshops (July 2006 and September 2006) were held in order to have further discussions with research collaborators and to consult with experts.

2. Case cities and methodologies used in the Waste Research

Due to time and resource constraints, a portfolio approach was adopted in research design, that is to say, examining the most prominent aspects of 5R in selected case cities, rather than attempting a comprehensive case analysis in all case cities. The case study cities we chose were Tokyo, Beijing, Manila, Bangkok, and Mumbai, which represented different geographical regions, economic development levels, and socio-cultural backgrounds in Asia. Case reports were commissioned for Beijing, Bangkok and Manila. Due to the loss of human resources on the UE project, the Mumbai case was dropped, and the Tokyo case was discontinued. For the same reason, the integrated analysis was not conducted. In each case study city, a combination of qualitative and quantitative analyses was conducted to effectively address the chosen issue of the city, based on the data collected from field surveys, questionnaire, and interviews with local stakeholders.

2. Achievements

2.1. Overall scoping research

The overall scoping research has focused on identifying the theoretical and practical challenges to addressing global issues such as GHG emission at a city level. It was found that while some of the obstacles were real, many of them were a reflection of contradicting perceptions, interests, and priorities in local as well as national government. It was also found that the integration might bring synergies, and there are ways for developing cities to tap into this potential.

2.2. Researches related to transport

a. Reduction of Transport Activities

(1) Yokohama case study

The study described the transportation and environmental conditions of the city. It also dealt with the urban planning framework of Japan in order to see how urban planning policies can be adopted. The study reviewed the policies on dense, mixed use, and pedestrian friendly urban design.

The study found the following: (1) the air quality in the city is less problematic after a peak in the 1960s, while GHG emissions from the transportation sector represented the biggest source and

were increasing. One reason is that the newly residential areas are designed more for car-dependent lifestyles; (2) the urban planning of Japan is top-down and vertical in terms of administrative and legislative arrangement, and the city is trying to be more flexible by using the agreements and ordinances; (3) the mixed and dense land use is promising in the city and policies for both site-specific and neighbourhood-level mixed land use in the central business district (CBD) are being pursued. While in the suburban areas, the Transit Oriented Development (TOD) was announced as a core area to keep certain levels of density ; (4) much attention is paid to the pedestrian and NMT- friendly urban design and interest among the public is also high. Yokohama's bike rental system and Car Free Day movements initiated by non-profit organisations and community- based organisations (NPO/CBO) are examples of this high interest; (5) the city aimed to create several self-sufficient TOD cores and promote a multi-core metropolis.

(2) Bangkok case study

By examining Bangkok's recent master plan and transportation planning, air quality, and urban planning, this study concluded: (1) high car dependency in Bangkok was caused by the increases in income of Bangkok citizens and the policy of the Bangkok Metropolitan Administration which gives priority to road development; (2) the reduction of travel demands can be carried out through promotion of mixed land use which is expected to reduce travel demand; (3) promotion of a pedestrian-friendly environment could also support the reduction of travel demand; and (4) the above two issues have been addressed to a certain degree in the current Bangkok Comprehensive Plan. It was noted, however, that the impacts of this plan would not influence the present situation in Bangkok right away.

(3) Shanghai case study

Based on the data on transportation conditions in Shanghai with relation to urban planning frameworks and a survey on pedestrian-friendly urban design in the blocks in Shanghai, this study found: (1) the air pollution in the central part of the city is mainly derived from vehicular emissions; (2) Shanghai's urban planning framework is highly controlled by the municipal government; (3) the policies related to dense and mixed land use in the city are already in place in Shanghai, including the restriction of new large-scale developments, adequate dispersion, and creating open spaces and necessary urban infrastructures; and (4) Shanghai still has a great possibility of becoming a pedestrian-friendly metropolis as NMT still accounted for 60% in 2004. Analysis of the current socio-economic status in Shanghai found that pedestrian facilities are increasingly drawing attention from developers, the government, and citizens as the economy develops.

b. Modal Share

(1) BRT in Jakarta

By examining the BRT policy, which was the first dedicated to bus lane systems introduced in Asia and is now being expanded, the study found that: (1) the poor state of public transport due to economic crisis in 1998-2001 has given room for the adoption of a new bus system and the emerging idea of BRT from 2002 onwards was very timely considering the urgent need to save public transport from bankruptcy; (2) the adoption of the plan by the Governor and his strong commitment have paved the way for political support from parliament and the general public; (3) the strong financial capacity of the Provincial Government of Jakarta has made the speedy implementation possible; (4) the role of the international community such as ITDP (Institute for Transport and Development Policy) in the USA has been very substantial, especially in providing

Jakarta with the BRT information of Bogotá; (5) the participative planning process of Jakarta BRT has created a strong ownership among government officials and the public of Jakarta; and (6) the ambitious implementation of the new BRT has focussed more on physical infrastructures, not on operational, financial, management, or institutional aspects. Finally, it was concluded that although the BRT system seems successful in the short term, unless clear, further development looking at a longer perspective is formulated the sustainability of providing the service in conjunction with other modes of public transport may be impaired.

(2) Vehicle restraining in Beijing

Based on the review of the current motorising trends, environmental problems, and future forecasts, the potential for the implementation of vehicle restraining policies was analysed in this study. Major findings include: (1) an increase in vehicles is causing negative effects including air pollution, congestion and noise pollution; (2) various policies have been implemented by the Beijing government to address those issues and have been effective in controlling air quality but not successful in reducing congestion and noise pollution; (3) policies implemented to limit car use include increasing parking fees, increasing consumption tax for larger engine passenger vehicles; (4) use of parking pricing policy is most important in constraining car use in Beijing and has been successful; (5) the government is planning to extend the pricing by increasing the rate and using it over larger areas but major barriers include public acceptance and lack of a sufficient public transport system; (6) options should be sought to reduce the utilisation of cars given the high rate of ownership.

(3) NMT in Mumbai

The major findings of the research on the potential of NMT in Mumbai include: (1) neither a lack of awareness, theft or adverse climatic conditions were major barriers to NMT in Mumbai but dominant factors included the relative expense of bicycles faced with the affordability of motor vehicle travel and (2) that promotion of NMT has substantial benefits both in the form of GHG and local emissions control. Through multi-criteria analysis and examination of various policy alternatives, the study came up with short-term strategies and long-term strategies. The former includes policies to provide separate bicycle lanes and parking places at all metro and bus stations; strong promotional/awareness campaigns and capacity-building programmes; and inter-modal integration. The latter includes integration of NMT into the public transportation system and a bicycle lending system with the necessary financial mechanisms in place.

(4) Comparative analysis of BRT introduction in Jakarta, Seoul, and Beijing

BRT is now drawing attention from the global community for its potential to reduce not only air pollutants but also emission of GHGs at a lower cost than rail systems. [1] Based on the examination of three pioneering cases of BRT introduction in Asia from the perspective of lesson drawing, the paper came up with the following useful findings: (1) during the process of BRT introduction in the three cities, lessons were drawn from the Latin American good practice cases in Curitiba and Bogotá. Interestingly, however, the major origins and lessons to be learned differed from city to city; (2) the Asian economic crisis in the late 1990s seems to have affected the shift in the values of the policy makers in Jakarta and Seoul to some extent in motivating them to seek lower cost solutions to provide public transport which thus focused their attention on BRT systems; (3) strong political will was found

1. In 2006, the Executive Board of the Clean Development Mechanism (CDM) agreed to approve the baseline and monitoring methodologies in the proposal of the Bogotá BRT.

to be a common thread in the adoption of BRTs in the three cities. The influence of former mayors in these Latin American cities could be said to be one of the driving forces behind the commitment of those political leaders. There were interactions and visits between the former mayor of Bogotá and the Jakarta Governor and between the former mayor of Curitiba and the mayor of Seoul and (4) different international organisations played important roles in technical assistance in Jakarta and Beijing. On the other hand, Seoul's transport reform was supported by domestic experts.

2.3. Researches related to waste

(1) Beijing case study

The Beijing case explored the possibilities of and barriers to introducing circular economy (CE) in a rapidly developing context and its possible impacts on solid waste (SW) management. The following conclusions were reached: (1) it is important that both the central and local government play enabling and leading roles in promoting CE, but they need to integrate the initiative into market mechanisms for a lasting and successful outcome; (2) there is no basic circular economy law in China, although there are several related laws and existing regulations so it is urgent that China builds up the relevant legal system to ensure the promotion of the initiative at local level; (3) the departmentalisation and vested interest of different governmental sectors might become a barrier in promoting a CE; (4) the lack of human resources and knowledge capacity in government departments may lead to a bottleneck in promoting CE; (5) the CE in Beijing is implemented at three levels: enterprise level, industrial park level, and city level, and (6) solid waste management is increasingly becoming a challenge to the city's environmental management, contributing to a significant portion of the city's GHG emissions - about 60% of total methane emission in Beijing came from the SW sector, while 1.04% of CO_2 emission came from the same sector.

(2) Manila case study

Through analyses of treatment technology changes from the perspective of cost benefit, carbon consequence, and roles of and impacts on stakeholders, this study found: (1) decisions in the SW sector were often not based on sector-related concrete facts but more on political decisions affected by concerns from beyond the sector, such as air pollution concerns and the livelihood of slum residents; (2) the political and cultural context of the city played an important role in shaping SW sector policy; (3) public participation might prioritise local concerns at the expense of global benefits. Incomplete cost-benefit analysis partly contributed to such an outcome; and (4) the recent prohibition of incineration in Manila might be driven by the political agenda of international NGOs, which do not necessarily reflect the public interest in the true sense.

(3) Bangkok case study

By examining SW management in Bangkok, the study found: (1) the most remarkable 3R policy being implemented is "reduction of SW by 10% per year" by the Bangkok Metropolitan Administration (BMA) and important implementation strategies for this policy include waste generation prevention, waste utilisation, waste disposal, and measures to improve waste collection disposal practices; (2) the adoption of 3R promotional policies and strategies denotes institutionalisation of 3R practices that until recently were largely a community, informal sector or NGO phenomenon; (3) the level of institutionalisation has moved not only from community to the local government level, it has now been well incorporated in the national government policy. The Bangkok 3R study thus illustrates that institutionalisation of good practices can indeed be replicated

and multiplied. It is also an illustration that the bottom-up approach does work but only when it is done through bringing together the community, the local government, and private sector external assistance through NGOs or directly from donor agencies.

2.4. Other publications

a. IRES Special Edition

The UE project organised and produced a special edition of the International Review for Environmental Strategies entitled “The Environmentally Sustainable City” (Volume 5, Number 2). Apart from the organisation and coordination of this special edition, three articles were authored by project members.

b. MOEJ commission paper

The project completed research commissioned by the Ministry of the Environment, Japan which aimed at carrying out a comparative study of the waste management practices in Japanese and German cities. The final report was submitted in early FY2005

c. Commission by Kitakyushu and JICA

The project completed research commissioned by the city of Kitakyushu and the Japan International Cooperation Agency entitled the “Kitakyushu Model for Sustainable Society” and also published a report called the “Handbook of Environmental Measures in Kitakyushu city,” in both English and Japanese.

d. Publication of a report based on the Second Phase Researches

The project published a report entitled “Urban Energy Use and Greenhouse Gas Emission in Asian Mega-cities: Policies for a sustainable future” in January 2005. The report was a result of the Second Phase research. The project also published a report entitled “Urban Environmental Management Challenges in Asia” in March 2005 and disseminated it just ahead of and during the 5th Ministerial Conference on Environment and Development in Asia and the Pacific (MCED-5), which was held in the Republic of Korea.

e. Report funded by START

The project completed an eighteen-month study entitled “Urban Transportation and Emission Interactions in the Kathmandu Valley, Nepal: Strategies for integrating global carbon concerns into local air pollution”. As part of the research in Kathmandu on 29 and 30 July 2005, a workshop was organised by the project in collaboration with the Ministry of Population and Environment of Nepal, and major stakeholders were invited. The final report was submitted in September 2005. The project was funded (USD 18,000) by the Global Change System for Applications, Research and Training (START), of Washington DC.

f. JIE Special Edition

As a follow-up publication to the IHDP session organised by UE, UE reached agreement with the Journal of Industrial Ecology, a highly regarded international journal, to produce a special issue on

Global Impacts of cities. In addition to the papers that were presented at the IHDP session, an open call for contribution was widely distributed, attracting a pool of 25 papers. Through a peer review process, 10 papers have been chosen for publication. The special edition will come out in March 2007. The planning, organisation, peer review process and paper selection works were carried out by project members in close collaboration with the editorial office of the journal.

2.5. International Workshops

a. Session at the IHDP Meeting

The project successfully organised a session entitled “Urban Transformation and Reforms for Sustainability: Local solutions for global change” on 11 October 2005 at the 6th Open Meeting of the Human Dimensions of the Global Change Research Community in Bonn, Germany. A publication from this session is being planned by the project, as referred to above in 2.3.f.

b. Session at the World Urban Forum

The Third Session of the World Urban Forum (WUF3) was held in partnership with UN-HABITAT from 19-23 June in Vancouver, Canada, with the theme being “Our Future: Sustainable Cities - Turning Ideas into Action”. During the forum, participants from more than 150 nations discussed, debated and shared experiences on how to make our cities better places to live. The project hosted a side event entitled “Integrating Global Concerns into Urban Management in Asia: Challenges and Experiences”, inviting prominent scholars as well as practitioners including the former mayor of Honolulu, the Vice Governor of Bangkok, and the mayor of Rizhao City, China.

c. Sub-workshops at the Better Air Quality Workshop

The project organised two sub-workshops, entitled “Travel Demand Reduction as a Co-benefit Policy Tool” and “Modal Shift towards Public Transport” at the Better Air Quality workshop, held on 13-15 December 2006 in Yogyakarta, Indonesia. Researchers involved in the transportation research described in section 2.2 presented the results of their studies. [2] In addition, a guest speaker from the Seoul Development Institute presented Seoul’s experiences in transportation reform and its ensuing impacts on emission reductions. Major discussion topics included the need for a methodology to analyse the impacts of land use on GHG and air pollution emissions, the importance of an integrated perspective and the need for developing a theory for public transport in Asia.

3. Self-evaluation

3.1. Relevance

a. Research related to transport

The studies in this category are closely related to policy processes and discussions in that: (1) the studies were conducted through close interaction with stakeholders in each case study city; and (2) the results were disseminated at the Better Air Quality Workshops, one of the most active policy platforms for air-related environmental issues in this area. It is difficult to assess the actual effects of

2. except for Mumbai case.

the results of the project researches on the policy processes at this moment since the results were presented just recently (December 2006). These results can be utilised for future IGES activities including the Asian Mayors' Dialogue for the Promotion of Environmentally Sustainable Transport in Cities to be held in April 2007.[3]

b. Research related to waste

Waste sector studies are closely linked to many national and sub-national policy processes, including the 3R initiative promoted by the Japanese government and increasingly becoming an international initiative, and the promotion of a circular economy and overall well-being society in China.

3.2. Effectiveness

a. Researches related to transport

- In terms of the goal (*to contribute towards the better management of the urban environment in Asian cities by developing new ideas and tools, analysing various factors that facilitate the formulation and implementation of policies, and evaluating their limitations and advantages*), the researches showed some achievements in analyses of factors that facilitate the formulation and implementation, and in evaluation of their limitations and advantages. The studies were essentially analyses of existing policies that did not advance to the stage of developing new ideas and tools.
- Regarding the objective (to *explore ways of linking GHG mitigation concerns to local environmental management in cities of developing Asian countries with the notion that such linkages help to alleviate some financial limitations, to transfer technology, and to address urgent concerns regarding long-term global issues*), the results of the case studies showed that this objective was not paid enough attention to in analysis.

b. Researches related to waste

The study has been designed to be consistent with the original research goals and objectives. Progress was underway in individual cases in accordance with the overall research design. However, due to the loss of human resources in the middle of the phase no integrated analysis was able to be conducted, and thus the findings are limited to those at a case level.

3. IGES is commissioned by MOEJ on the planning and organisation of this policy dialogue.

3.3. Efficiency

a. Researches related to transport

- **Human resources**
  There was a major turnover in research staff during the Third Phase due to the suspension of the projects and difficulty in re-developing “clear and concise research proposals”. As a result, the project only had a year and half to complete the studies for the Third Phase and had to drop some case studies or themes such as those researches related to transport fuels. The instability of human resource hindered their efficient use. This situation was addressed by: (1) commissioning work to those who left full-time positions; (2) commissioning case studies to experts in Asian cities; and (3) mobilising staff from the LTP project.

- **Financial resources**
  Financial resources were spent mainly on salaries, fact-finding mission trips, books, and commission fees. The effectiveness of expenditure on salary was not high due to the discontinuation of research works due to the high turnover. Almost all the fact-finding mission trips contributed to the development of researches (both by IGES staff and commissioned work) and can be evaluated as fruitful. For commission fees, effectiveness varied depending on the capability of the counterpart but commissioned work provided substantial amounts of local data which are difficult to obtain from overseas.

b. Researches related to waste

- **Human resources**
  The waste sector research suffered from a significant lack of human resources. The sector started with two full time researchers, with one of them having various other responsibilities including the overall scoping study, organising IHDP sessions that included but were not limited to waste sector research, organising and guest-editing the special edition in the Journal of Industrial Ecology (IHDP session publication) and organising a special networking session at the World Urban Forum III. Both researchers left the project before the end of the phase, and no additional staff members were recruited.

- **Financial resources**
  Apart from salaries, the major expenditures in the waste sector were on the three commissioned papers. The commissioned reports received are of good quality in general, and thus it has been cost efficient. No overseas field trip was conducted with the project fund.

4. Conclusions

There has been significant accumulation of research results in the area of urban environmental management. The results are, however, mostly related to cities in western society. Not only do the cultural, social and economic backgrounds of western cities differ from those in Asia, but also their demographic conditions and urban infrastructures are completely different. The theories applied to western cities, such as the theory of smart growth, cannot be applied directly to Asian cities without examination.

The UE project has studied various Asian cities since the first research phase using the case-study methodology. However, due to the prominence of the existing western theories on urban environmental management, IGES researchers found great difficulties in analysing issues and in

developing ways to solve problems in Asian cities. This could be the reason why the project had to be suspended by the peer reviewers in the middle of the Third Phase and why almost all Third Phase researchers left IGES by the end of the phase. As a result, this project could not achieve its initial target even though Asian cities are now facing urgent environmental issues.

IGES has learned a lot from this lesson. In the Fourth Phase we will restructure the previous project, dividing it into a solid waste related theme and a transportation related theme rather than a single, all-encompassing theme.