

**APEC INTERNATIONAL WORKSHOP ON "CREATING SUSTAINABLE CITIES
THROUGH URBAN ENVIRONMENTAL MANAGEMENT":
FINAL REPORT**

**Held at the Asian Institute of Technology
in Bangkok, Thailand
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.1. INTRODUCTION

From March 6-8 of 2000, the Urban Environmental Management Field of Study at the Asian Institute of Technology (AIT) convened a workshop on "Creating Sustainable Cities Through Urban Environmental Management". Held in pleasant surroundings at the AIT Center in Bangkok, Thailand, this event flowed from a June, 1997 commitment by Canada at the Asia Pacific Economic Cooperation forum (APEC) meeting of Environment Ministers in Toronto. Because of the high priority of *solid waste management issues* for urban municipalities across the Asia Pacific, these were selected for particular attention.

Per capita waste generation rates in Asian cities remain below those for many Western economies. However, they are rising quickly, especially in relation to the capacity to deal with them.

**TABLE 1: URBAN SOLID WASTE GENERATION
IN SELECTED URBAN REGIONS REPRESENTED AT THE WORKSHOP**

URBAN REGION	POPULATION	GENERATION RATE PER DAY	TOTAL WASTE IN KG/DAY
Chongquin, China	2,752,000 (1997)	1.20	3,302,400
Jakarta, Indonesia	9,160,000 (1993)	0.66	6,045,600
Vientiane, Laos	180,000 (1998)	0.58	104,400
Singapore	3,000,000 (1996)	1.10	3,300,000
Bangkok, Thailand	5,876,000 (1998)	1.00	5,876,000
Chiangmai, Thailand	167,000 (1998)	1.87	312,290
Phuket, Thailand	Not available	2.15	Not available
Udonthani, Thailand	137,000 (1998)	0.62	84,940
Ha Long, Vietnam	Not available	0.55	Not available

Source: Daniel Hoornweg with Laura Thomas, *What a Waste: Solid waste Management in Asia*. (Washington, D.C.: World Bank, 1999). Waste generation rate for Ha Long, Vietnam is for 1997.

The workshop was organized under the attentive leadership of Dr. Walter Jamieson, Director of the Canadian Universities Consortium Training and Technology Transfer Program (CUC-TTP) at AIT. Pallavi Mandke was responsible for day-to-day arrangements leading up to the event. Funding, some in-kind contributions, and

logistical support for the workshop were supplied and managed by Environment Canada, principally by the Environmental Technology Advancement Directorate. Primary source of funding for the event, especially to cover travel costs and facilitation, was the Canadian International Development Agency (CIDA) via the Conference Board of Canada.

Public display materials and a prototype Website for urban decision-makers were prepared and presented by the Administration Directorate of Environment Canada, building on previous work on environmental operations for governments.

Participating in the workshop were 60 senior municipal officials and others engaged in environmental decision-making from 9 economies across the Asia Pacific region. (See Annex "A".) They came from 31 different municipalities and district authorities, including some of the largest in the region, e.g., Bangkok, Chongquin, Jakarta, Singapore, Shenyang, Taipei and Tianjin. Representation of different economies was as follows: Cambodia (3); China (4); Chinese Taipei (3); Indonesia (2); Laos (5); Philippines (6); Singapore (1); Thailand (31); Vietnam (5).

TABLE 2: PROFILE OF PARTICIPANTS

ECONOMY:	NUMBER OF PARTICIPANTS:	CITIES AND REGIONS REPRESENTED:
Cambodia	3	Phnom Phen
China	4	Chongquin, Shenyang, Tianjin
Chinese Taipei	3	Taipei
Indonesia	2	Jakarta, Makale
Laos	5	Pakse, Sawannakhet, Thakhek, Vientiane
Philippines	6	Cebu City, Dapitan City, Dipolog City, Roxas City, City of San Fernando
Singapore	1	Singapore
Thailand	31	Ampur Muang, Bangkok, Chiangmai, Kheang Khoi, Lamphun, Phisanulok, Phuket, Sriracha, Ubonratchathani, Udonthani, Yala
Vietnam	5	Da Nang, Ha Long, Hai Phong

TOTAL	60	31 municipalities and districts
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Wherever possible, invitations were sent to people in municipalities with planned or ongoing investment projects in the field of urban solid waste management, whether financed by the World Bank or supported by CIDA and other bilateral aid agencies.

Specific bilateral meetings with the World Bank representative took place during a break in workshop proceedings, and the prognosis is good for practical follow-up on specific projects as a result. In addition, as many as 250 faculty, students, and others from AIT, as well as participants and resource persons, toured the displays associated with the workshop and interacted with the exhibitors.

Senior officials and experts made fact-filled, action-oriented presentations at the workshop. Institutions represented in addition to the World Bank were: the United Nations; the Government of Thailand, Environment Canada, CIDA, AIT, the Asian Disaster Preparedness Center, the Canadian Embassy, the Thailand Environment Institute, and the International Centre for Sustainable Cities. In all, 23 officials and experts from Thailand, Canada and the United States took part.

Specific objectives of the event were to:

- Build/strengthen the network of municipal decision-makers who can exchange tested practical solutions most useful to cities in the Asia Pacific region.
- Explore practical issues of solid waste management as an example of how to achieve more sustainable cities... meaning that people will still be able to live in them 20 or more years from now, in increasing health, safety, and wealth, and with less poverty and discrimination.
- Develop means of exchanging information more quickly on this subject, within existing resources.
- Test use of the Internet as tool of letting people know about latest information and keeping in touch cheaply.

Permanent results of the event include: a collection of major policy papers, case studies, and presentations for ongoing use by municipal decision-makers; a technical presentation on sound landfill practices in the Thai language; a video of low-cost waste

recycling practices made during one of two field visits; an Environment Canada guidance document on setting priorities for urban solid waste management; and an updated World Bank presentation on options for financing and managing solid waste management services.

AIT plans to place most of these resources on their Website, and also to make them available on demand from others in hard copy form. In addition, selected case studies and guidance documents will also be made available on the "City Solutions Network" being launched by the Administration Directorate of Environment Canada in consultation with CIDA and the World Bank.

2. WORKSHOP PRESENTATIONS AND DISCUSSION ON MARCH 6

2.1 Introduction

During the first day of the workshop, invited experts linked solid waste management issues to the wider concerns of sustainable urban development, including other aspects of the environment, municipal finance, governance and coordination of Official Development Assistance. For each set of remarks, the following information is provided here:

- The main message or messages for workshop participants and readers.
- Key questions remaining after their presentation, raised by the rapporteur on behalf of participants, as a way of stimulating further thought and discussion.
- Some suggestions for practical starting points for action based on review of the literature, and comments by presenters and participants.

2.2 Opening Session

Professor Jean-Louis Armand of France is President of AIT. In his opening remarks, Professor Armand noted that AIT is concentrating its efforts in education, research and outreach on three aspects of urban environmental management: solid waste management; clean water; and clean production. In his view, the main solid waste issues to be addressed revolve around *financing and management*, including organizational structures, rather than technology as such. In this regard, he noted dangers that government authorities in Southeast Asia may be tempted to adopt "high-end" technologies without considering their sustainability at the community level. It is essential to learn more about how to transfer technology back and forth between Northern and Southern economies. In this context, institutions like AIT have a vital role

to play, because they operate at a regional level, and can integrate lessons from both parts of the world.

Professor Armand noted and welcomed the roles played by the Swiss Agency for Development Cooperation, the U.S. Agency for International Development, the British Department for International Development, the Swedish International Development Agency and the Danish International Development Agency, as well as CIDA in the Southeast Asia region and in conjunction with AIT.

He concluded by quoting that the Earth is being borrowed from our children, and that we should not compromise their future.

The 10,000 alumni of AIT represent a huge intellectual resource for the whole of Southeast Asia in a variety of fields, including urban environmental management. However, their efforts can be multiplied many times over if local educational institutions also adopt priority aspects of urban environmental management within their curriculum, research, and practical projects. Thus, the main question arising from Professor Armand's presentation appears to be how other universities, colleges and research institutions across the APEC region could be engaged in expanding on AIT efforts.

A starting point for further work along these lines in the region might be a curriculum development package based on AIT materials and examples that combine education with practical research and outreach to take back to individual institutions in each participating economy.¹

Sunthat Somechevita is Permanent Secretary of the Ministry of Science, Technology and the Environment of Thailand. He began his remarks by commenting that a substantial proportion of solid waste in Thailand is simply dumped in an uncontrolled way on land. Even where solid waste is collected, he added, as much as 70 percent is not properly disposed of, e.g., in sanitary landfills, by recycling, or other means.

There is an urgent need for Thailand and other economies in the region to find better solutions. In particular, it is essential to shorten the time required to learn about solutions that work well in developing economies.

A key question arising from Mr. Sunthat's remarks is how those from other economies

¹ It appears in this regard that AIT itself will be expanding work on solid waste management issues in both Vietnam and Cambodia, as well as in regions of Thailand well beyond Metropolitan Bangkok.

can learn from *failed* experiments and experiences as well as from successes, quickly and without embarrassment. It is quite understandable that many local governments may not wish to discuss what has not worked well, because of the time, effort and prestige invested in various solutions. Yet unless there is objective analysis of what went wrong, it is going to be much harder to make progress.

A practical starting point could be to document carefully and sensitively lessons to be learned from "failed experiments" *and* from successes in solid waste management, avoiding "finger-pointing". Examples of problems include: why sanitary landfill projects have stalled in some cities; why source separation has not started, etc.²

His Excellency Bernard Giroux is Canada's Ambassador to Thailand, with responsibility for Laos PDR and Myanmar as well, and is based in Bangkok.

He focused his remarks on the major challenges facing the Asia Pacific region as a whole, and on the urgent issues arising from urban poverty in particular.

This region is the main arena facing the immense problems of rapid urbanization over the next 20 years. The key issue to be resolved is improving the conditions of some 600 million people who are or who will be living in unsafe, unhealthy, unserved communities.

Canada is deeply committed, along with other donor economies, to working to help partners to find and implement effective solutions to solid waste management and other urban issues, recognizing the rural and urban poverty are interconnected.

Ambassador Giroux's comments -- coupled with remarks by the President of AIT on the multiplicity of Western donor agencies -- prompted a question: how could bilateral agencies best *combine their efforts* in order to maximize their impact on urban issues like solid waste management? One practical starting point in this regard would be to map out current solid waste-related activities of bilateral and multilateral agencies in each economy. Such a "map" could help identify ways to combine efforts and achieve more results through partnerships.

The workshop itself contributed to this "mapping" process by bringing together municipal participants from different projects funded by the World Bank, the Canadian

² An example of how this can be done is offered by the U.S. Federal Emergency Management Agency which prepares detailed reports on what failed after every natural disaster.

International Development Agency, the Government of Thailand, and other sources. In addition, there was an observer at the workshop from the German development agency GTZ, and Asian Development Bank officials were kept informed of the event.

Jean Bilodeau is Director General of the Administration Directorate of Environment Canada, and is based in Hull, Quebec. He is responsible for all buildings, vehicles, computer systems, telecommunications systems, and supplies for a department of 5,000 people operating in many locations across Canada.

- Mr. Bilodeau's main theme was that government agencies can use their own operations as "laboratories" to try out new approaches to solid waste management. He mentioned the example of the "No Waste" program currently operating at Environment Canada and in other agencies, and being spread to other Canadian Federal departments as well. This resulted in a reduction of more than 80 percent of solid waste going to landfill sites. There are other examples in the field of energy efficiency and "green procurement", of starting with innovative public sector activities and then moving them out to other levels of government and to private sector companies.

- According to Mr. Bilodeau, unless governments themselves show leadership in their own operations, it is hard for them to advocate greater environmental responsibility to industry or to households. An obvious question posed by Mr. Bilodeau's comments is how the respective government departments and agencies of municipalities in Southeast Asia might use *their* operations as laboratories to test new ideas and show the way for others in society. In many cases, the public sector at national, provincial and municipal levels is the largest single "business" in the economy.

As a practical starting point, workshop participants are invited to document the environmental impacts of their own respective government operations. They could look for *low-cost or revenue-raising opportunities* to show very visibly to the public that they are being both responsible and innovative. For example, if a solid waste reduction program is put into effect, municipalities could put up signs on government buildings to tell the public about their efforts.

Dr. Suvit Yodmani is Executive Director of the Asian Disaster Preparedness Center, located on the AIT campus in Bangkok. He is a former senior United Nations official.

In his keynote address, Dr. Suvit noted that there are many elements of achieving sustainable cities. He referred to: air quality; water quality; sewage treatment; energy conservation; surface water management; the built environment; heritage conservation; and solid waste management, including hazardous waste. Based on a survey of United

Nations offices in different regions of the world, solid waste management has been identified as a priority of the Asia Pacific economies.³

- Dr. Suvit noted that there are already many good policy ideas and much advice available on what should ideally be done to manage solid waste better, from the United Nations system and from other sources. Yet there are also many obstacles to be overcome, including inadequate finance, lack of public awareness, inadequate administrative capacity, a "not in my backyard" attitude, and improper planning.

Two main questions arose from Dr. Suvit's wide-ranging presentation. The first was: recognizing that there cannot be a dozen or more "real" priorities for senior decision-makers, how can urban leaders set priorities among the many aspects of achieving more sustainable urban development? The second was: within solid waste management itself, what knowledge and tools can best help municipal leaders to set and to pursue priorities?

The rapporteur suggested as a practical starting point that experts in the field could assist decision-makers in establishing and tackling priorities. They could develop specific checklists and methods for assigning priorities to solid waste among urban sustainability issues, and also within solid waste management itself.

Examples would be to set priorities based on:

1. removing immediate threats to public health and livelihoods;
2. maximizing returns on public expenditure; and
3. engaging most voluntary effort in waste reduction and recycling.

In the next presentation, it was noted that the World Bank is already proceeding along this path, and will soon publish a detailed guide to strategic planning for solid waste management.

Dr. Carl Bartone is Principal Environmental Engineer at the World Bank, and is based in Washington, D.C. in the United States of America.

³ Solid waste disposal also appeared at the top of a list of "issues and challenges facing cities today" in a survey of urban leaders undertaken by the World Bank in May of 1999. See *Urban Age* Volume 7, Number 1 (Summer, 1999), p. 28.

He began by noting that the World Bank has learned a lot from its own investments in urban solid waste management over the past decade, which total 72 projects worth over a billion U.S. dollars. As a result of its experience, however, solid waste management has come to be considered one of the *higher risk areas* for Bank lending.⁴

- Nevertheless, the Bank is still lending for solid waste management projects, and currently has 20 projects in the pipeline. Acceptance is based on five main criteria:
 - Municipal strategic planning of solid waste management services must take place in advance of lending.
 - Projects must couple physical improvements such as the purchase of new equipment with institutional strengthening.
 - Municipalities must give attention to more efficient municipal operations as part of any project undertaken.
 - There is a strong emphasis on more effective borrower financial management.
 - Most relevant from the perspective of the workshop, improved environmental protection must be a part of the project financing package.

In general, the Bank is *not lending* for projects which involve simply purchasing new collection equipment such as garbage trucks, in isolation from other parts of the system for charging user fees, reducing, managing and disposing properly of solid waste.

- Dr. Bartone also expressed the view that private sector involvement can make a positive contribution to Bank-financed projects if three specific criteria are met. These are: competition amongst prospective service providers; transparency in letting contracts; and accountability through strengthened public sector decision-making and institutions.

He stressed that simply contracting with the private sector in the absence of a stronger public sector role could lead to problems.

The rapporteur commented afterwards that quite a number of workshop participants may wonder how they could prepare to qualify for loans from the World Bank or Asian Development Bank to undertake a solid waste management project or program. He suggested that perhaps the World Bank could begin by publishing an integrated guide

⁴ That is, Bank officials believe the chances of failure are relatively greater in this field than in some others.

to preparing to borrow for sound solid waste reduction, management, and institutional projects. Ideally, this would be made available in the most common languages of the region. Dr. Bartone indicated in responding to this suggestion that such a guide for municipalities was currently in the editing stages, and would appear during the year 2000.

2.3 Luncheon Speech

Dr. Arthit Ourairat is Minister of Science, Technology and the Environment of Thailand. He has been active for years in both academic and political life in Thailand, has been Minister of Foreign Affairs, and of Health, and is a leading advocate of reform.

- He opened his remarks by commenting that although Thailand wants to be known as a top tourism and investment destination, it risks becoming known as a place that has difficulties in solid waste management, since only about 27 percent of waste receives proper disposal. In this context, he said the government of Thailand is acting vigorously on a coordinated plan to address this issue, but still has some distance to travel. There are still major problems in locating sites for safe and proper disposal, since a "not-in-my-backyard" attitude prevails. However, progress is being made in engaging the private sector in solid waste management and also in source separation, composting, and recycling.

A key change is required in public attitudes, so that solid waste management is regarded as "everybody's business", and school children learn about their responsibilities at an early age. In addition, there are severe problems of fragmentation amongst local authorities, of which there are about 8,000 in Thailand. Municipalities are being encouraged to set up a consolidated waste management centre in each province of Thailand.

The commitment of the Minister to reforming solid waste management practices in Thailand is evident. Arising from his speech is the question: how can other political leaders be encouraged to show the same obvious intelligence and foresight? How can "political will" to overcome public apathy and entrenched interests in the status quo be generated?

An example of a practical starting point for helping to create political will in the future would be to map the potential coalitions in different Asia Pacific economies which would put solid waste management onto the policy agenda and make it a "winning proposition" for local, regional or national political leadership. Examples of potential coalition members would be: tour operators; hotel owners; environmentalists; nature

lovers; residents living near current open dumps; suppliers of waste disposal systems; investors in recycling ventures; potential buyers of energy generated from waste; and others.

2.4 Afternoon Session

Mr. Bob Odeh of CIDA conveyed greetings on behalf of the Agency and on behalf of Susan Davies, Director of the Southeast Asia Regional Program. He spoke highly of the work of AIT and its importance for the region as a whole. He also noted that the workshop could provide lessons to replicate in other parts of the world.

Mr. Chris Hanlon is Senior Advisor, International Affairs, in the Environmental Technology Advancement Directorate of Environment Canada, based in Hull, Quebec. He began his presentation by describing the work of the Environmental Technology Advancement Directorate at Environment Canada. This Directorate works on both domestic and international issues of environmental technology transfer and capacity building. Associated with the Directorate is a Wastewater Technology Centre, located in Burlington, Ontario, and also the Environmental Technology Centre in Ottawa, which undertakes vehicle emissions testing. The Directorate also works with Canadian Environmental Technology Advancement Centres, which operate as public-private partnerships to help small and medium enterprises. It has quite a number of Memorandums of Understanding with various governments, including those of China, India, and Mexico. An example of Directorate efforts is use of biotechnology for cleaning up contaminated sites, e.g., using plants and trees to absorb toxins. In another case, it is promoting conversion of urban transport vehicles to compressed natural gas.

Dr. Chaiyod Bunyagidj is Vice President of the Thailand Environment Institute, a non-governmental organization based in Bangkok with a staff of 180 people.

He began his talk by reviewing different concepts of "clean production" in industrial plants: "pollution prevention"; "source reduction"; "clean technology"; "industrial ecology", "eco-efficiency", "green production", etc. He noted that, although they use different terms, they are based on similar principles.

Efforts to promote waste reduction through alternative and innovative production methods, product design and composition, are all based on systematic analysis of both products and processes. They must compete with end-of-pipe methods for consideration by industry managers. In other words, they must either cost the same, or actually generate savings over time.

While environmentalists may strongly favour cleaner technologies because of their evident benefits over the long term, end-of-pipe methods also have some advantages to

be countered: they tend to be simpler, with lower risks, capable of being implemented quickly, and well known to regulators. The "bottom line", however, is that they are reactive and transfer the environmental problems into the future or into someone else's backyard.

Dr. Chaiyod noted that much can be achieved through picking the "low-hanging fruits" of cleaner production... it need not be a costly undertaking to the plants involved. However, it is essential to invest time and effort in stakeholder engagement to build support at a community level for specific priority actions, and then to implement them with municipal, industry, and resident involvement.

The rapporteur noted of Dr. Chaiyod's very comprehensive and positive presentation that it raised a vital question: how could financing and incentive packages for industry most effectively promote action to obtain savings from cleaner production? Could government and industry actions on cleaner production actually be self-financing through savings? He suggested as one practical starting point a guide to national government programs and tax incentives to promote cleaner production, including what has worked and what has not worked well. He also put forward the idea of economic research to determine how changes in industrial operations could be financed from savings, especially through venture capital for small and medium enterprises.

Dr. Willi Zimmermann, who comes from Switzerland, is a Professor in the Urban Environmental Management Field of Study at the Asian Institute of Technology. He remarked that as human beings, we have known the principles of good governance for at least 2000 years, though we do not always operate according to these principles.

The "governance" agenda, including democracy, rule of law, human rights, reduced military spending, and combatting corruption is now of increasing concern to lenders such as the World Bank, to the United Nations, and to national leaders as well. All of these institutions recognize that progress in economic and social development depends on governance. "Governance" means more than democratic government and replacing politicians every four years, and also goes beyond formal structures of democracy and formal representation to include "civil society" and promoting people's own capabilities and self-reliance.

One of the things we have learned about governance is to organize things so that each function is and can be undertaken legitimately at the level best suited to do it, whether at the international level, the nation state, the region, the community, or the individual

company and household.

While the rapporteur believed there was much validity in the passionate belief in good governance expressed by Dr. Zimmermann, he commented that not all economies are as fortunate in their history as Switzerland. Indeed, a key issue arising from his remarks is how governments which have in the past taken on *all* responsibility for solid waste management in their societies can now "climb down off the tiger". How can they devolve responsibility in a way that does not simply push off the problem to others unprepared to take it on? For example, in Canada, a number of provincial governments have been active in the past and then simply transferred responsibilities to municipalities, without considering the full implications. The rapporteur also remarked that some participants may feel the nature of the task of assigning appropriate functions to appropriate levels, called "subsidiarity" by Dr. Zimmermann, may be more complex than it first appears. In fact, the debate amongst governments is often precisely *who* is most competent and prepared to undertake a given task or function. A question arising is: how should this principle of matching functions to levels be applied in the field of solid waste management? One practical starting point would be to prepare a guide based on comparing actual performance of different ways of assigning government authority and resources to different solid waste management functions. There is experience in a variety of economies with different models.

Nathaniel (Dinky) von Einsiedel is Regional Coordinator for Asia and the Pacific of the United Nations Urban Management Programme, and is based at AIT. His presence there greatly facilitates efforts to link United Nations with other programs in the region.

According to Mr. von Einsiedel, experience shows there are five typical concerns surrounding solid waste management: negative views of scavengers; worries about health effects of waste management methods used; opposition to nearby waste management sites; debate over choice of technology and cost; and limits of management capabilities, including a lack of skills and training, and inadequate operating systems and procedures.

A key underlying issue in all of these concerns is that solid waste management is considered to be a low-status job, whether within municipal government or in the streets of cities. Partnerships amongst governments, businesses, and consumers can help to overcome all of these difficulties, especially when triggered by a crisis situation, such as loss of tourism due to fouling of beaches. Non-governmental organizations have a vital role to play, for example, in organizing and improving the conditions in which rag-pickers operate.

Mr. von Einsiedel put forward six categories of actions: environmental education and

public information campaigns; national legislation; organization of waste-pickers; organization of community recycling and reuse; capacity-building for local authorities coupled with finance; and public-private partnerships. He noted that innovations in policy and operations arise from crises. Without a crisis, no one bothers. However, in the solid waste management field, every municipality has a crisis to work on, and around which partnerships can be mobilized.

As part of his presentation, he noted a case study of the City of Seattle, Washington, in the United States. This city undertook an "environmental performance evaluation" of all of its main operations, involving a budget of US\$ 1.9 billion annually and about 10,000 municipal employees, working in over 350 facilities. Looking into a variety of city activities that affect the environment, the study noted different machinery, carpentry, and electrical shops, power dams and substations, water treatment facilities, fuel storage tanks, solid and hazardous waste, fuel consumption, materials consumption, construction, grounds maintenance and use of hazardous products on a daily basis.

Seattle also developed a whole range of environmental performance indicators, linked specifically to environmental objectives, targets, financial benefits, environmental and human health benefits, and responsibility centres for data collection. The aim has been to establish a basis for tracking all of the City's activities so that improvements and progress toward environmental targets can be monitored. By measuring results, it has been more feasible to ensure that the gap between what the City says and what it does is not too wide.

A key question from Mr. von Einsiedel's remarks and case study is: how can solid waste management agencies and other government operations also take effective action and then measure the results of what they have done from a balanced and multi-disciplinary perspective? A practical starting point for doing so would be to pull out simple targets and performance indicators relating to each of the main concerns about solid waste management. Municipalities could use these locally both to help form partnerships and to measure their success in acting.

2.5 Conclusions About Day 1

Presentations on Day 1 offered a great deal of valuable information about a very serious and pressing topic to participants. However, the rapporteur believed it was important also to inject some humour into the proceedings to stimulate reflection and learning. Accordingly, he presented the following "contest results" as Day 2 began.

ENTRIES IN AN "INTERNATIONAL CONTEST FOR CREATIVE SOLID WASTE MANAGEMENT SOLUTIONS"

Japan:	<i>Raising Public Awareness by Taking Exquisite Photographs of Recycled Solid Waste</i>
China:	<i>Vigorous Five-Year State Investment Plan for Managing Solid Waste</i>
Australia:	<i>Storing Solid Waste Safely Down Under</i>
United States:	<i>Launching a Billion Dollar E-Commerce Business Based on Solid Waste Management</i>
Russia:	<i>Using Decommissioned Nuclear Warheads to Incinerate Solid Waste</i>
Scotland:	<i>Squeeze Each Penny: Saving Money by Reducing Solid Waste at Source</i>
Switzerland:	<i>The Progressive Role of International Banking in Solid Waste Management</i>
Germany:	<i>More Efficient Methods of Solid Waste Management: Examples from the former German Democratic Republic</i>
England:	<i>Correct Etiquette for Disposing of Solid Waste</i>
Italy:	<i>Making Pasta from Recycled Solid Waste</i>
France:	<i>Making Solid Waste Management More Exciting Than Making Love</i>
Canada:	<i>Solid Waste Management: Is it a Federal Responsibility or a Provincial Responsibility?</i>

3. FIELD VISITS ON MARCH 7

3.1 Introduction

In his opening remarks on Day 3 summing up the experience of the field visits during Day 2 of the workshop, the rapporteur noted that the various examples presented raised the importance and the opportunities for:

- finding clues to guide future action in routines of human behaviour, such as developing a weekly exchange of garbage for valued objects like eggs for cooking;
- finding guidance for action in the unexpected, such as the sudden and urgent community desire to act on a polluted beach which is threatening livelihoods;
- avoiding stereotypes about what results will look like, for example, being open to the idea that lessons can be learned from village communities that do apply in urban areas;
- looking at the action in not acting and examining the reasons for drift that leads to increased use of open dump sites;
- promoting diversity and avoiding a technological "monoculture" in solid waste management, e.g., the idea that incineration or some other technology may be the "one best solution".

3.2 Video on Thai Hotel Initiative

En route to the first field visit to a landfill site, workshop participants saw a video on an initiative in the seaside resort town of Hua Hin, Thailand. There, garbage swept in from offshore to compound the problem of waste left by residents and visiting tourists. The situation resulted in adverse press coverage and an initiative by five hotel owners or managers to help clean up the situation.⁵

The CUC-UEM-TTP worked with the hotels to undertake: green purchasing; waste reduction; waste segregation; and backyard composting. Specific assistance was required by the hotels in basic design of the composting system, record-keeping, staff training and incentives.

Comments arising from the video include the following:

- The type of composting activity being promoted at the hotels looks sustainable,

⁵ A major article appeared in the *Bangkok Post* on March 3, 2000, entitled "Hua Hin's decay can be arrested", commenting on the problems in the town and actions taken to date to address them. The journalist concludes: "Having seen Hua Hin go from good to bad and now to worse, I cannot share [a local hotel manager's] optimism, not unless more people get involved in cleaning up the measurements."

but the specific format, going on very close to the hotel, may cause some problems. As the project evolves, there may be an opportunity to reduce human toil through technology.

- A key issue is whether the "energy" to undertake composting can be maintained over time after the initial interest and novelty have worn off.
- Earnings from recycling go into staff welfare fund, which acts as one type of continuing incentive. However, this would need to be placed into the context of staff wages as a whole. There may also be opportunities for giving individual recognition to hotel staff who do most.
- It will likely be necessary to link individual hotel action and wider municipal action. That is, over time, hotel owners will need to be backed up by larger infrastructure for using compost and recycling non-compostable items. Inevitably, the issue will arise of whether hotels which choose not to take part will be penalized.

3.3 Video on "Garbage for Eggs" Project

Residents of a Klong Toey neighbourhood within Bangkok suffered for many years as a result of annual rains and flooding caused by loose garbage blocking the sewage system and surrounding canals. Over several months in 1996, residents managed to collect and remove the garbage on a one-time basis. However, leaders recognized that unless various items were entirely removed from the waste stream, they would continue to be thrown out, and would bring back flooding problems in future years.

The "Garbage for Eggs" project was launched in August of 1997 when money previously used to hire project personnel to clean up the area was used instead to buy eggs which could be exchanged for recyclable items collected by community members. Residents were asked to clean their own neighbourhoods and to bring organic and other wastes to collection bins as well. Later, the recyclable items were sold to a local scrap dealer and the money used to buy eggs.

However, the program does not recover its full cost, because the value of eggs distributed is higher than earnings from sales of recyclable items. Special consideration is given to the elderly, children, and those who work for the project in distributing eggs, and subsidies are obtained from local foundations, individuals, and the Social Investment Program of the government. The "Eco-Club" which runs the program is in the process of spreading it to other neighbourhoods, and is also experimenting to processing organic waste with support from the CUC-TTP of AIT.

The rapporteur suggested that the simplicity of the program was appealing and seemed to support its survival. Its original leaders had followed the classic steps of organizing a community around a tangible issue and then promoting wider cooperation once confidence was established. The project did face a crisis when its original leadership were not elected to office, and now was carried on by others.

"Succession" or moving from the founding group to a new group of active people is often a challenge for voluntary and non-governmental organizations in particular. In some cases, as well, too much publicity can cause internal tensions and practical pressures on the time of leaders which can undermine voluntary efforts.

Over the longer term, it will be important to decide how best to mesh community-based initiatives like "Garbage for Eggs" with formal municipal structures responsible for solid waste management. In addition, it remains to be seen whether the experience gained and confidence built in local problem-solving on waste collection can also be applied to wider issues of urban neighbourhood upgrading. In both cases, it is clear that municipal authorities need to be able to respond quickly and flexibly to community initiatives, and to help keep momentum going, once it is established. This means authorities may need to be ready to address a number of different sectors at once, if community interests and issues cross over the boundaries, e.g., between solid waste management and water supply or urban agriculture. The benefit of responding rapidly and creatively to community initiatives is that the same resources may be used to achieve several goals at once. An example is when collecting garbage improves health, creates some employment, and builds community confidence for bigger projects.

3.4 Visit to Kam Paeng Saen Sanitary Landfill Site

This is one of two landfill sites serving the Bangkok region, and is located in Nakhon Pathom Province about 100 kilometres northwest of the city. The site is 150 hectares in size. Originally commissioned in 1989, it can deal with about 5,000 tons of solid waste daily.

The Bangkok Municipal Administration has ventured into private sector construction and management of solid waste facilities. The "Group 79" company won the contract to build two transfer stations along with the Kan Paeng Saen landfill site, including transportation of waste from the transfer stations to this site.

The company is paid 214 Baht per ton of solid waste consigned to the landfill, which is supervised by the Metropolitan Authority Pollution Control Department. The intent is to call for new bids every five years.

The company has been moving to increase the range of revenue sources from the site, including separation of waste to obtain recyclable materials and compostable materials, and a system of pipes to collect methane for generating energy. However, investments along these lines have apparently not yet paid off, for unspecified political and perhaps technical reasons.

Visitors to the site visit could not help but notice the high level of security surrounding the visit: no photos were allowed, nor were the visitors allowed to move beyond the confines of the administration building. This raised the question of whether private entrepreneurship in solid waste management would inevitably bring about secrecy of operations, as companies try to protect their methods of reducing costs and deriving revenue. Practically speaking, is the level of "transparency" required for public accountability in conflict with competition for the management contract. Under such conditions, would authorities learn about it if the site were not in compliance with environmental regulations?

On a more positive note, visitors from the workshop found the graphic and oral presentation by the landfill management very professional and helpful in thinking about their own situations. For example, they learned first hand of difficulties in adapting landfill methods well suited to North America to the conditions of Bangkok. The chief engineer noted that "there are too many melons in Bangkok", resulting in difficulties obtaining methane from the bottom of the landfill, and the need to collect from the top instead. This and other examples of the potential to learn from people in similar situations doing new things would appear to be very valuable for future programs in the same field. The Bangkok landfill experience suggests both that technologies uniquely suited to conditions in Southeast Asia can be developed and adapted, and also that presentations such as the one made by Group 79 Company should be made more widely available.

3.5 Visit to Pathom Asoke Community

This Buddhist community of approximately 400 people is located in the Muang district of Nakhon Pathom province, also about 100 kilometres from Bangkok and within the metropolises "shadow". The majority of people in the 13-hectare community are full-time residents. Some visitors from elsewhere in Thailand and from other economies are also given accommodation. There are about 20 "religious representatives", equivalent to monks and nuns in the community.

Pathom Asoke attempts to be as self-sufficient as possible, and runs its own farm, medical centre, kitchen, gas station, school, print shop, and various workshops. It produces and sells herbal products, food, and some consumer goods at low prices. Money earned from these sales is used to buy imported goods and services, including electricity and vehicle fuel. In addition, some members of the community work at outside jobs as well as volunteering time to community undertakings.

Most relevant to the theme of the workshop were three elements of the community:

- community recycling depots, with separation of garbage at source, and immediate use of compostable materials in community gardening;
- a project to convert plastic waste into fuel, using a machine designed by a resident;
- a pervasive public awareness and education program which consisted both of direct presentations by community leaders and signs mounted throughout the community.

Questions arising from the visit included the following:

- Can messages about community responsibility for solid waste management be put into our actions and our permanent structures? Can the problem of "too many messages" be avoided?
- Since large-scale scientific laboratories do not have a monopoly on innovation, especially where it is hoped for widespread community adoption, how can results from inventors in makeshift laboratories also be encouraged and made widely available?
- Since it was very evident that community residents were taking pleasure in their work, can solid waste management be turned into fun?
- Should the limits of consumer-driven culture be exposed as part of public campaigns to reduce solid waste generation rates?
- Should urban "intentional communities" like the one at Pathom Asoke be enlisted to the cause of reducing solid waste and recycling it, or will the majority of urban dwellers reject the options they present as being too distant from their own experience and wishes"?

4. WORKSHOP PRESENTATIONS ON MARCH 8

4.1 Exhibits

A portion of the morning of the last day was spent visiting the exhibits presented outside the main hall used for the event. Those who developed the exhibits stood by them and explained their contents. Included among the exhibits were the following:

- a demonstration Website being developed by Environment Canada;
- a display on "greening government operations" by Environment Canada;
- a display of World Bank resources, focusing on urban upgrading;
- a display of sound landfill techniques in a Southeast Asian context by the Pollution Control Department of Metropolitan Bangkok Authority;
- displays on projects of the International Centre for Sustainable Cities in Indonesia and in Thailand;
- a display on the work of the United Nations Urban Management Programme;
- displays on the solid waste management efforts of the following municipalities in Thailand: Lumphun, Phitsanulok, Yala.
- a display by the City of San Fernando, the Philippines.

Contact information for those offering displays is contained in Annex "C".

During the remainder of the day, there were six presentations, all on specific aspects of solid waste management and on tools for improved urban environmental management.

4.2 Pilot Projects in Solid waste Management

David Dungate is Senior Project Manager for the International Centre for Sustainable Cities, based in Vancouver, British Columbia, Canada. This is a Canadian non-governmental organization founded in 1993, and based in Vancouver, British Columbia, Canada. It has sustainable cities projects in Thailand, Indonesia, the Philippines, China, India, Poland, Turkey, and Canada itself. The Centre always seeks to promote a balance of environmental health, economic growth, social well-being, and community involvement. It develops and uses demonstration projects to build local capacity.

ICSC works actively with cities on: identifying needs, priorities, and expertise; securing funding sources; implementing action plans; managing risks; and evaluating progress and results.

Mr. Dungate's presentation concentrated on a project called "SEALSWIP" or South East Asian Local Solid Waste Improvement Project", conducted in Udon Thani and Hat Yai, Thailand; Iloilo and Bacolod, Philippines; and Rantepao and Makale, Indonesia. Demonstration projects include efforts in public education, composting, a waste-picker co-operative, and municipal staff training. Activities following on from SEALSWIP projects include World Bank lending, CIDA projects, and Thai government projects.

Main challenges encountered in carrying out projects have included perceptions of the Centre as outsiders, corruption, and unresponsive political or bureaucratic systems. From experience to date, ICSC has learned about the importance of local project ownership and control, the need to focus on results, and the opportunities arising from stakeholder collaboration. It would appear that SEALSWIP is a sustainable model for all ICSC projects.

Walter Jamieson, Director of the Technology Transfer and Training Project introduced the work of the CUC-UEM-TTC on solid waste management in general, noting their involvement in practical projects in Thailand (Garbage for Eggs, Hua Hin), Indonesia (Bali), and Cambodia (Siem Reap).

Pallavi Mandke then described in more detail the Hua Hin project on hotel waste management already presented in video form on the previous day. She noted that the five hotels involved were having a wider impact on the city of Hua Hin, by demonstrating source separation, direct sale of recyclable materials, and composting. They were reducing the volume of overall municipal solid waste and the amount required to go to landfills. Lessons learnt from the project included:

- The necessity and potential for smaller cities and towns to take action on solid waste management.
- The potential to convince hotels to undertake solid waste management and to train their employees to do so.
- The potential to repeat the model elsewhere.
- The need to complement hotel initiatives with wider municipal action.

She also noted that a part of the project had direct social benefits, as when reusable items discarded by hotel guests, e.g., soap, foodstuffs, etc., are distributed to poor people in the surrounding community.

Janeen Tang then described a "Material Recovery Facility" undertaken on the island of Bali, Indonesia in conjunction with a local non-governmental organization called The Wisnu Foundation. This project arose in response to growing problems of waste generation from both tourists and the local population, which led to increasing dumping and burning of garbage, pollution and health risks.

The Jimbaran Lestari Company developed the facility based on hauling waste from ten hotels in Bali. It is used for recycling scrap to be sold to dealers, preparing pig feed sold to farmers, and composting sold to organic farmers. The Material Recovery Facility divides waste into wet waste, dry waste, and garden waste. These materials in turn feed into one of six streams, in a system that is almost a "closed loop". Exceptions are some septic tank flow into the municipal sewage treatment plant, and solid residue going to the official government dumpsite.

Benefits noted for the Facility include: implementation of the "polluter pays" principle; a "green" image for the Bali hotels; employment opportunities; significantly reduced solid waste going to dumps; and improved data about solid waste composition. She noted that successful waste management calls for multi-disciplinary planning: environmental, economic, social, cultural, political, legal, institutional, and technical.

4.3 Using the Internet to Improve Urban Decision-Making

Jean Bilodeau made a presentation on the "City Solutions Network" being developed by Environment Canada in consultation with the World Bank. He was assisted by Shelley Emmerson who did a demonstration of the Website contents and navigation.

This project had its origins in internal work of Environment Canada on "greening government operations", as well as work on an international scale with the Organization for Economic Cooperation and Development (OECD), the Organization of American States (OAS), the Asia Pacific Economic Cooperation forum (APEC), and the United Nations Environment Programme (UNEP).

Environment Canada is focusing all of its efforts in this field on finding high quality information and practical tools for urban decision-makers. The aim is to sort and manage the large volume of information and data now available via the Internet so that busy mayors, senior officials, business and community leaders will be better served.

Urban decision-makers are typically focused on both day-to-day choices in managing their cities and providing urban services, and also in periodic major decisions about large-scale infrastructure projects, such as landfill sites or rapid transit systems. They are often looking for revenue-generating or low-cost environmental initiatives, as well as for environmental actions that will create or protect jobs, e.g., in tourism.

Environment Canada research found that relatively few tools and little information available on the Internet today is geared to the specific needs of urban decision-makers in developing economies. Yet the Internet has a definite potential to link people quickly and cheaply with their peers and colleagues, can secure large amounts of information quickly, and increase democracy and transparency. It is essential to overcome technical, content, and "information overload" barriers to wider, more effective use of the Internet by cities.

One way of assuring quality content and focusing the flow of information on crucial issues facing municipalities is to direct attention to "tough choices": setting priorities for resources; choosing technologies and suppliers; attracting investors; reducing negative environmental impacts; etc. If information can help resolve these tough choices, it is likely to be valued and used by urban leaders. Mr. Bilodeau gave a number of examples of such "tough choices" in the solid waste management field, including selection of appropriate disposal technologies, and charging residents for waste collection services.

Professor Yap Kioe Sheng is Head of the Urban Management Centre at the Asian Institute of Technology. His presentation focused on use of the Internet for information exchange and training to build the capacity of municipal decision-makers. As a backdrop to his work, he reviewed the rapid growth of urban areas in Southeast Asia, the need for solutions to problems such as solid waste disposal, and the potential of the Internet as a tool for accelerating learning. One method tried by the United Nations is

disseminating stories of municipal "Best Practices" in different locations and sectors, now available on a CD-ROM.

However, Dr. Yap believes that the Best Practices approach has important limitations. Individual write-ups may not make it clear what the process used, the problems faced, and the conditions for success actually were. In some cases, it is hard to determine how successful a Practice actually has been, and where it may have failed.

Dr. Yap's team began by putting the Best Practices relating to Asia into a different format to make them more useful, and placed them on the World Wide Web to make them more widely accessible. They added contact information for each Best Practice to facilitate exchange and offered links to other Websites.

Overall, they still found that an interactive approach would be preferable, since people always want to know more about a given practice, and because conditions in different places vary so much. This led to the idea of a "Virtual Policy Studio", using a type of software developed in conjunction with the University of Cardiff.

Dr. Yap made a brief demonstration of how this software would work to facilitate interaction amongst people in different municipalities who remain in their own locations. He indicated that a trial run in the field of municipal finance would start shortly.

5. CONCLUSIONS BASED ON PRESENTATIONS AND FIELD VISITS

Over the course of the workshop, participants learned from experts and also from those on the front lines, including participants themselves, that solid waste management is a growing urban issue in Asia, that is not going to go away or be denied. It represents a serious challenge to the sustainability of cities.

Moreover, solid waste management is closely linked to other aspects of sustainable urban development, such as clean air, clean water, poverty reduction, renewable energy supply, health protection, industrial efficiency, and community empowerment. Success in addressing solid waste issues can assist in finding solutions or can actually offer solutions in these other fields too.

In the course of the workshop, presenters such as Dr. Carl Bartone of the World Bank indicated that quite a number of solutions have already been tried in different cities, and that they are succeeding in both reducing the volume of solid waste and in disposing of it more safely and assuredly. Results from careful analysis of what works and what does not are already available. There does not appear to be any single "winning" solution, though sanitary landfill sites are likely to be a part of the mix of

solutions adopted everywhere. Private sector involvement can bring benefits to cities through improved collection and disposal services, but only in the context of transparent, competitive conditions and of effective public sector regulation of its activities.

There are clearly some early opportunities for success in improving solid waste management. One can focus on key revenue-generators in the tourism industry such as hotels, on manufacturing industry sources of waste, and on collection for resale of materials that pay for themselves. In tackling all solid waste management issues, it is essential to consider the topic from a variety of perspectives: political, social, economic, environmental, administrative, and technical, and also to consider who can do what best.

There are a number of barriers to additional and/or more effective action on solid waste management:

- In some municipalities, it may have a low priority in relation to other urban issues, even though substantial amounts are being spent on collecting garbage.
- People associated with solid waste management may have a low status within the municipal administration, and also within the communities most affected, e.g., scavengers.
- Lack of organization and lack of incentives to take action may mean that a crisis point must be reached before resources can be mobilized, e.g., flooding caused by blocked drains, an infestation of rats leading to disease.
- There is often a lack of money for collection, treatment or recycling, and disposal of solid waste.
- Effective mechanisms to collect user fees for solid waste management services may be missing, and there may be political reluctance to charge for what has been a "free" service in the past.
- There may also be a lack of knowledge and information about options.

While it would be pleasant if the Asian Institute of Technology or Environment Canada could assist with the first five barriers in a direct manner, they cannot. These are the responsibilities of the participants. On the last item, however, the event is an aid to better information and consideration of creative solutions.

It is quite possible to get around the barriers to more sustainable solid waste management, in a variety of ways, as indicated by workshop presentations and visits:

- It is very important to "seize the moment" offered by a crisis in the way things are currently being done to push for change. For example, in the Bangkok community in which the "Eggs for Garbage" project was initiated, the drainage system had been blocked by solid waste, causing flooding during the rainy season.
- It is quite acceptable and desirable to start with talk amongst stakeholders. However, it is also important to recognize that different stakeholders may have conflicting interests. Some may want to keep things as they are, while others are pushing for change. Some may want public sector solutions while others want privatization. Thus it is essential to engage in early positive actions to build mutual confidence, even if these are on a small scale.
- Sustainable solid waste management is most likely to occur over the longer term when the major interests are engaged from the beginning in planning new initiatives.
- To achieve success, it is essential not to try to do everything at once, but to work according to a clear set of priorities, building confidence, allowing time to raise awareness, combining talk and action, until more ambitious goals can be set and tackled.

Some starting points for action include:

- Getting the basic facts about the solid waste situation in your city together.
- Finding and contacting counterparts in other cities to make initiative presentations on what they have done.
- Finding sources of small amounts of funding for start-up and training.
- Deciding on targets and indicators so that progress can be measured.
- Engaging the public, in particular through the mass media.

Overall conclusions reached were that the workshop was a useful event for bringing

together people already engaged in the subject. The importance of solid waste management for sustainable urban development still needs to be pursued further with those not yet aware of the issue or not yet engaged in action to fashion solutions.

6. WORKSHOP EVALUATION AND FOLLOW-UP

A preliminary assessment of the results achieved by the workshop is provided in the table below. Average cost per participant was approximately \$1,250, but four of those from higher income economies in the region paid their own way.

ASSESSMENT OF WORKSHOP RESULTS BY OBJECTIVE

OBJECTIVE:	EXTENT TO WHICH ACHIEVED:	COMMENTS:
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Build/strengthen network to test practical solutions	Active exchanges amongst 60 participants and 23 officials and experts over three days. Four practical solutions explored in detail. Six bilateral meetings on planned projects held with World Bank representative. Too soon to tell if achieved, though prognosis is positive, given keen interest of participants.	Long-term follow-up depends on establishment of communities of practice amongst participants.
Explore practical issues of solid waste management	Focus on sanitary landfill techniques and recycling, especially related to rapidly growing hotels and tourism industry. Achieved.	Basis established for active follow-up by Asian Institute of Technology in specific projects for Thailand, Cambodia, and Vietnam, and by International Centre for Sustainable Cities in Philippines, Thailand, and Indonesia.
Develop means of exchanging information more quickly	Extent of current and potential Internet use via electronic mail explored, and connections made. Partially achieved, as connections at low cost and with assured access remain a problem in this region.	Barriers to rapid exchange of information still exist in region, including difficulties of language, lack of Internet connections, high cost of Internet service, and lack of relevant information and tools.
Test use of Internet as a tool for supporting sound urban environmental decisions	"City Solutions Network" Website demonstrated, along with AIT Internet project, with 18 surveys completed and returned regarding Environment Canada prototype Website. Achieved.	Significant amounts of useful information on solid waste management exist, but translation and adaptation to regional conditions required.

The following commitments have been made in following up on the workshop:

- The staff of AIT-CUC-TTP will make this report and the documents associated with the workshop available on their Website.
- Environment Canada will include information from the workshop in their City Solutions Network Website.

- An effort will be made to maintain contact by e-mail with workshop participants and to engage them as additional opportunities arise.
- The World Bank will pursue specific project opportunities with individual cities as appropriate, and make available the forthcoming strategic planning guide for ordering by participants.
- Environment Canada will report on the results of the workshop in APEC and other fora, and also on results of a survey of Internet requirements by participants.

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ANNEX "C": BASIC DATA ON SOUTHEAST ASIAN ECONOMIES REPRESENTED AT THE WORKSHOP

ECONOMY	URBAN POPULATION, 1995 (MILLION)	URBAN SOLID WASTE, 1995 (TONNES/DAY)	URBAN POPULATION, 2025 (MILLION)	URBAN SOLID WASTE, 2025 (TONNES/DAY)
Cambodia	1.0	Not available	Not available	Not available
China	363.7	287,292	831.7	748,552
Chinese Taipei	12.3	Not available	Not available	Not available
Lao PDR	1.1	734	4.3	3,453
Philippines	37.2	19,334	77.6	62,115
Singapore	3.0	3,300	3.4	3,740
Thailand	11.6	12,804	28.8	43,166
Vietnam	15.3	8,408	46.1	32,269
TOTAL FOR ECONOMIES WITH COMPLETE DATA AVAILABLE	432.9	331,872	991.9	893,295

Sources: Statistics for all economies except Cambodia and Chinese Taipei adapted and calculated from Daniel Hoornweg and Laura Thomas, *What a Waste: Solid waste Management in Asia*. (Washington, D.C.: World Bank, 1999). Data for Cambodia from Government of Cambodia. Data on Chinese Taipei from Canadian Department of Foreign Affairs and International Trade.

"D": RESULTS OF A PARTICIPANT SURVEY ON INTERNET USE AND REQUIREMENTS

Summary of Main Results

During the workshop, the Administration Directorate of Environment Canada had a display on a prototype Web-based "City Solutions Network" available for participants and others to visit and try out. A survey form was provided to participants early in the workshop and collected at the end of the final day.

Of the 60 participants, just under one third responded, from a range of Asian economies:

ECONOMY:	NUMBER OF SURVEY RESPONDENTS:
Cambodia:	2
Laos:	5
Thailand:	7
Chinese Taipei:	1
Philippines:	2
Vietnam:	1
TOTAL	18

Among the respondents, the vast majority are currently connected. Those who currently use the Internet are most likely to be "other professional staff" such as

engineers, or computer specialists. A majority of those using the Internet now do use it to look for solutions to current problems. However, they are hampered by poor quality of service, high cost of service, lack of relevant information, and difficulties arising from so much information. Among those who had comments on the prototype City Solutions Network, most could use it, but quite a number would also like to learn more about it first. Priorities for future use of the Internet are as follows, ranked in order:

- Find more information that relates to Southeast Asian conditions;
- Get a good and/or less expensive Internet connection;
- Reduce the amount of useless information received.

Detailed results are presented below.

Survey Tabulation

1. Does your city have a connection to the Internet now?

Yes - 14 No - 4

2. Who uses it most of the time?

Computer specialists:	7
Planners:	2
Other professional staff:	13
Mayor/council members:	3
Other (Technical advisor to an NGO):	1

3. Do you use the Internet to find solutions to major issues your city faces (among those already connected)?

Yes - 8 No - 3 NA - 3

4. What are the main problems with the Internet in your municipality or department?

Poor quality or high cost of service :	6 + 2
Lack of suitable information:	7
Too much information to search through:	7

	Other (limited access):	1
	No response:	1
5.	How do you rate what you have seen of the City Solutions Network?	
	We could use it:	11
	We could not use it right now:	2
	We would like to learn more about it first:	10
6.	What are your priorities for future use of the Internet?	
	Get a good and/or less expensive connection:	9
	Find more information that relates to Southeast Asian conditions:	12
	Reduce the amount of useless information I receive:	7
7.	Would you be interested in learning more about the City Solutions Network in the future? Yes - 18	

ANNEX "E": FORMAL PRESENTATION SLIDES

ANNEX "F": BACKGROUND PAPERS

