

And it seems to us that these are certainly the two key lessons that we have learned over the last ten years or so. Thank you.

Chairman

Thank you. Do you have any other questions? If not, we would like to close the presentations by cities and we will have a coffee break now.

..... *COFFEE BREAK*

United Nations Report ||||||||||||||||||

Mr. Graham Philip Alabaster
Human Settlements Officer
United Nations Centre for Human Settlements (Habitat)

Chairman

Now I would like to resume the session. We will move on to the United Nations Report from the United Nations Centre for Human Settlements (Habitat). The United Nations Centre for Human Settlements established a Fukuoka office on August 1 1997 within this ACROS Building. I understand that several projects are underway, particularly in the Asian region, including technological assistance and model operations in the human resources department and many others. The theme of this conference concerns waste management and we should be able to learn a great deal through the Asian projects. The next speaker is Mr. Graham Philip Alabaster, the Human Settlements Officer of Habitat. He is with the Nairobi Headquarters. Without further adieu, Mr. Alabaster, please.



Mr. Graham Philip Alabaster (HABITAT)

Good afternoon, ladies and gentlemen. I'd like to thank you very much, Fukuoka, for inviting us here this afternoon. I am from the head office of UNCHS in Nairobi. I am the officer there who is responsible for waste management. On behalf of our regional director here in Fukuoka, and the new office that opened in August this year, I'd like to thank you very much for inviting us to this meeting.

The topic of my short intervention this afternoon will be an overview of Habitat's efforts in the Asian-Pacific region and will include some of the conclusions that we have drawn in Habitat over a variety of projects over a number of years, not just here in the Asian-Pacific region, but in some of the other regions of the world. As we've heard in many presentations at this meeting already, there is an increase

in the production of waste worldwide, and most cities, whether they are from high income or low income background, have equal problems. The waste character is changing, not just in quantity in per capita terms, but also in composition. These changes are related directly to lifestyle, to population growth, and urbanization, and also to changes in government policy on waste minimization and recycling. As these factors combine, we find that the rate of waste production is increasing much faster than urban population growth. So it is a very serious challenge for city managers to work out exactly what to do to deal with this waste problem. As many of you know, there are very severe health and environmental risks associated with a lack of waste management services. And in many cases, waste management comes at a low priority to things we are more normally aware of, like water and sanitation. In recent years, however, people are becoming aware that waste does play a very important role. In fact, an example which I mentioned in my paper, was a plague scare in India in 1994. The overall message that comes from this incident, which as I say is reported in some detail in the paper, is that lack of waste management has an economic cost. For example, in the plague outbreak in one city in Surat, where fifty-six people died from the incident, the cost to the Indian economy was 600 million dollars, in terms of losses in tourism and losses of exports from the country. So we can see that a very small fraction of that 600 million, if it had been invested in infrastructure for waste management, would have been a worthwhile investment.

The other thing about waste is that it pollutes all environmental media. We find that water courses are polluted, sometimes water courses that people rely on for a potable supply. Air is polluted through spontaneous combustion at landfills, but also, of course, there is the greenhouse gas effect from methane from landfills. And of course, land is, in some cases, irreversibly contaminated, or contaminated to the extent that it is very expensive for local authorities to remediate. So there is an economic cost associated with poor waste management, or lack of waste management, which relates to health problems and economic problems. In some cases these are problems which are in the future and we don't take due account of those problem which will develop.

The other thing, my final point here, is that the role of the city waste manager is changing. Whereas in many cities twenty years ago, it was the usual practice for the public sector to run the solid waste management service, we have seen an increasing change, with privatization becoming much more utilized by local authorities. And now we see the emergence of another sector, the community or the informal sector. So a waste manager now has to deal with several new aspects in his portfolio of management.

Here are some statistics, many of which you have seen already. The thing I wanted to show here was the very huge increase in waste production, particularly in the US. We can see that over the past fifteen years, from 1975 to 1990, there is an absolutely huge increase in waste per capita production. I did mention that the character of waste was changing and it is an important point to note. We can compare the percentage composition of waste from Singapore, where we find a very large proportion of paper relating to packing materials, to the waste that comes from Delhi in India, where there is a very high organic content, basically food and vegetable waste. One of the reasons why Delhi has a higher proportion of organic waste is because a large proportion of the recyclables are removed from the waste stream by the urban poor.

So with that background, what are the most significant problems that the city waste manager has to face? The first one that we get confronted with more often than anything else, is the selection of adequate technology. One of the biggest problems with technology selection is that in a lot of countries there is a very diverse range of waste management equipment and waste collection containers and quite often they are not compatible. So it is very difficult for a city waste manager who is given a particular type of technology by a donor, to fit it in to their overall waste management system.

The next point, which comes up very frequently, is the fact that many city waste management departments don't have financial autonomy. There is no real incentive for them to make a profit, because the profit goes back into a central local authority fund and the waste management department will not have direct access to that money. So in many respects, for the waste management department, this is very important. Obviously, if the private sector is involved it makes revenue collection and paying the private sector very difficult if the waste management department is not separate.

The third point is that most local authorities have great difficulty providing a connection service in the lower income areas. There are a variety of reasons. One main reason is that the municipality feels that the low income area, which may be an illegal settlement or tenure, falls outside of their jurisdiction. Also, more often than not, it's a purely practical problem of access, in that the density of settlements in some Asian cities in the low income areas, precludes access by conventional refuse collection vehicles.

I mentioned earlier about this idea of coping with new partners. The city manager has to deal with the public, private, and informal sector. Also the history of waste management hasn't been one of collecting data on waste production. There are many cities who have, somewhere in their archives, data on the production of waste.

However, this data isn't actually fed back into the management process and used in strategic planning. City managers obviously have a problem with toxic wastes and one of the biggest problems is with small institutions — small clinics and hospitals and small industries — who effectively manage to dispose of their waste within the domestic refuse collection system. And also many waste managers at city level don't feel they have sufficient influence at a national policy level, in terms of changing attitudes toward privatization, changing attitudes toward waste minimization and waste recycling.

Habitat's strategy for solid waste management centers around three key points, which I am going to enlarge upon. The first is to adopt a hierarchical approach to waste management. The second is to look at developing an integrated system of planning for waste management at city level. And the third is to promote sustainable practices through demonstration, as this is probably one of the most important ways to convince users of the benefits of new approaches.

Adopting a hierarchical approach is basically embodied in the decisions at Rio back in 1982. It's also in the Habitat agenda, it was debated in Istanbul last year. Basically, it's about adopting a hierarchy approach to waste management, in that the first and most important strategy should be to try and minimize waste. I think that many city managers would be very pleased if they could minimize the problem of waste and it would certainly make them feel a lot happier. But perhaps they are not aware of how policies can be changed and how tools can be developed to bring about minimization. There have been very good examples of charging people on a volume basis for the waste that they produce. This is now becoming very popular and, in many cities, has led to great reductions in the actual volume of waste that people throw out. So that is one very significant way. Another way, which has become quite popular in Europe, is the use of a landfill tax or levy based on what you dispose. As we remember, there is a very small proportion of waste that needs to go to landfill, that has no other use. If we can recycle a large proportion of the organic waste and inorganic, such as paper and plastics, there is a very small volume of inert which would be disposed at landfill. City managers, of course, have a great interest in minimizing waste, because if production is minimized, it minimizes haulage costs, it minimizes disposal costs, and of course environmental damage.

The next level of the hierarchy is promotion of recycling and reuse. This can be done in a variety of different ways. It can be done by different actors and the local authority can play a role. But increasingly, particularly in some of the low income countries, we are seeing that the low income communities and the informal sector, already do this activity very widely. A good example is the City of Cairo

in Egypt, where the vast majority of domestic waste produced by the City of Cairo is dealt with by the informal sector. That city is probably unique, but there is nevertheless a changing attitude toward community involvement in waste management. The third level is the recovery of energy. This poses some problems with incineration, as the organic content does mean that the calorific value of the fuel is very low. But there are options that are being discovered and there is technology available for bio-gas generation and also in some cases for pyrolysis. And only as an absolutely last resort should we think about an environmentally sound form of disposal. In some case that will be incineration, in some case it will be disposal to land. Let me enlarge upon what I mean by developing an integrated approach. An integrated approach has several components. The first one I'd like to briefly mention is an integration of funding. In many cities there is a combination of external assistance, of local government and national government funds, and in some cases, fees from user charges, all flowing in to the waste management department. It is important that a careful coordination is made of these different sources of funding and they are put to best use.

Integration with partners is about managing this range of actors, the public, private, and community sectors, in an integrated manner to assure that all of the sectors perform. It must be seen that the private sector are sufficiently driven by the profit motive, the community sector are involved in providing a service within their particular area, and so forth, to ensure the partners all work in harmony and that the local authority is in control of what is going on.

The third point is the integration of health and environmental concerns. It is still very difficult for a city waste manager and a city health manager to work together in some localities and to see the benefits of promoting things like waste recycling and reuse. In many cases, the city health department should see contributions to the waste management department as a preventative health strategy, particularly in areas where waste related disease is a big problem.

And finally, integration of the livelihood linkages and environmental protection is valuable. By this I mean that we know that the informal sector, in many cities, already earn a reasonable living from the recycling of waste, but the opportunity to combine that income generating activity with environmental protection is probably unique within waste management. So that's a good example of a win/win situation that we can follow in our strategy against waste management problems.

And the final point in our strategy is to promote sustainable practices through demonstration; through the development of interactive tools, through field demonstration in the informal sector, and through prototype development. Here is one example of interactive tools. Habitat has developed a very simple computer program which

solid waste management planners can use to look at several different waste management scenarios. They can cost and do forward looking projections to see which would be most effective for their situation, before they even think about looking at any particular technology. They can use this software to combine, say, a different type of compactor truck together with something as simple as a tractor and trailer or even a horse drawn cart or a hand cart. They can use this computer program to develop scenarios to see which would be the best situation. An example of field demonstrations I will mention is setting up small scale recycling schemes in the field to show the community and to give them the opportunity to evaluate the economic benefits of such schemes. And in terms of prototype development, an example is providing technical design advice to waste management experts and to manufacturers. I'd like to share with you, finally, three projects which we have undertaken in the region over the past few years. There are some other projects detailed in the paper but I am just going to go into details of three. The first activity, which was undertaken in Pune, in India, back in 1990 to 1993 was a prototype modification. I am going to show you some 35 mm slides of this activity after I finish my overhead. But basically in brief form, the object of the exercise was to modify a locally produced collection vehicle to show how its volume and capacity could be increased. So we went to a local manufacturer, and gave them design advice about how to modify a locally produced vehicle. In this case it was a tartar vehicle (wheelbarrow) from India. Additionally, we offered recommendations about changes in working practices, such things as collecting refuse during the night time when there were less problems with traffic, certain changes to time and motion of employees within the department. We also designed a very simple hand cart for use in the low income areas of Pune, which we introduced to the municipal authority. We asked them to try it out in the locality to see if it worked. And then we held a familiarization seminar at the end of the small project, which many municipal commissioners from the different cities in Maharashtra State were invited to.

The second project, which was completed only about a year or so ago, was a study in five Asian cities, where we looked at waste recycling and reuse. The idea of this project was to try and influence local and national governments to incorporate waste recycling and reuse policy into their waste management legislation. We documented the informal sector waste recycling in these five cities, we looked at the relationships between the informal sector and the local authorities, and we held consultations at the city level to try to identify the constraints and to reduce the number of bottlenecks. The project produced some policy documents, but more importantly, a training manual and a video film for senior policy makers in government. And in several of those five cities we have seen a change in attitudes toward recycling.

And the final project I want to mention is a very new project which has just started. It is a little wider than just solid waste management. It deals with the idea that you cannot consider one aspect of environmental management alone and that provision of basic services for the urban poor should be considered across the board. Many governments don't have a mechanism to decide on how communities can be involved in the provision of basic services. This project is an attempt to try and institutionalize the process of community involvement in municipal planning. So this is very new project and it's due to start at the beginning of next year and we are looking forward to seeing how it goes.

In conclusion, my three parts are that policy makers should consider the much wider range of actors in waste management in general. They should consider not just the traditional public and private sectors but also the informal sector. Within Habitat, we see this as an area of growth and I'm sure it points to a good solution in many cities to some of the problems city waste managers are facing. There is also a need to look much more closely at the health and environmental aspects of waste management. There are probably many cities in the region where there is an episode like the plague epidemic in India just waiting to happen. We should make sure that it never gets to that stage and we should think now about linking the policy of waste management much more closely with the environmental health aspect that it causes. We need to begin to look at implementing the integrated approach at city level from these variety of different options; to look at the funding approaches, to look at the partnerships, and to look at how we can deal with and improve the overall management of waste. And at the community level we need to look more closely at how we link the environmental protection aspects with income generation. Okay, I would like to show, very quickly, five slides to illustrate some of the projects I was talking about. This first slide is to remind us about the danger of pollution of water courses. We can see here a very old, established landfill with a low income settlement perched on the top. You can see its proximity to a water course. Even though the system has been culverted, in heavy rains there is a heavy pollution problem.

This next slide is to remind us that in many cities it is the young children who are involved in scavenging activities and collecting waste and recycling. So, if for nobody else, we should consider the health effects young children such as this are suffering, as they are working on the dumps in the region. And this should be one of the pictures we have in our minds when we think about the environment and health aspects of not dealing with waste properly.

This slide is to give an example of just how persistent plastic is in a landfill. We can see here a landfill which was built a long time ago and we can see the

plastic there has not degraded at all. Many other components of the waste have degraded but the plastic is still there many, many years later. So even though we landfill this waste, the problem hasn't gone away, it's just been temporarily removed.

This slide shows the first project I mentioned, about the modification of the refuse vehicle. Very basically, the original refuse vehicle was a dump truck designed for collecting building waste and building materials. It was very unsuitable for solid waste management because the density of domestic refuse is much less. We modified the size of the hopper at the back and we increased the capacity by a factor of two. We also added a hydraulically operated loading shovel to make the loading of the operators much easier. Here you can see the machine in use. It is much easier for the operators to load with this loading shovel and you can see the greatly increased size of the vehicle. So this was an example of a simple modification of a vehicle, a change, a new prototype design, to greatly increase the productivity of the vehicle. This vehicle was in fact modified in 1993 and I am assured it is still working very well. I am very glad to hear that.

On that note, I'd like to thank you very much and ask you if you have any questions. Thank you.

Discussion ||||||||||||||||||

Chairman

Thank you very much for your wonderful presentation, Mr. Graham Philip Alabaster. Now we have completed all the presentations by the four cities and also the United Nations. We'd like to have a free discussion from now. To begin, we will ask Mr. Yonekawa of the United Nations Department of Economic and Social Affairs to share his impressions about this conference. Mr. Yonekawa has attended each Asian-Pacific City Summit, from the very first meeting. This means he has a wide perspective including the Working Level Conferences, and the past two Asian-Pacific City Summits.

Mr. Yoshinobu Yonekawa (UN DEPARTMENT of ECONOMIC and SOCIAL AFFAIRS)

I would like to touch upon, not technical, but some general points. The first Summit was in 1994. I attended that first Summit meeting in Fukuoka and the second in Guangzhou. In the first meeting, it was proposed that a working level exchange was also needed, therefore we initiated the Working Level Conference and are now in the second session. I understand the third conference is planned for July 1998. The United Nations was requested to act as an observer to these conferences and we have also participated. In the first meeting, we delivered the keynote address.

In Guangzhou, we also attended and Mr. Lai made a presentation. From our attendance and participation, we have noted that the Asian-Pacific City Summit objectives converge with the purposes of the United Nations. In general, we both strive to promote cooperation with and among developing countries. That is a policy of the United Nations and, here, there are a lot of cities participating. There are many cities from Kyushu, and Auckland is here, and most of the participating cities are from developing countries. Therefore, this conference is meeting its objective to strengthen the linkages within and among the developing and advanced countries. In this instance particularly, the objective of this meeting truly converges with our goal in the United Nations.

As for trends we have been witnessing, a high priority is decentralization. It is important not to rely only on the central government. We should shift from reliance on the central government to local government. The United Nations supports and encourages efforts to decentralize. In that regard it is very meaningful for us to attend these conferences. Also to that point, the purposes and goals of the United Nations and this conference converge. In the 1994 meeting we established a very meaningful network and by participating in this meeting we are actually utilizing that network. In various workshops we have been giving information to participating countries and also we have received information regarding our international conferences. Actually, the representatives of participating countries in this conference also attend our international conferences. Again we have been strengthening our network and the linkage amongst ourselves.

One impression I have had through attending this meeting is that the working level conference is undergoing a change. For example, in the first meeting the discussion was centered on general matters. However, discussion is now becoming more concrete and specific in terms of the topic or theme. I believe there was a proposal from Pusan for the topic of a working level conference and this working level conference was realized in a very immediate manner. Also in Guangzhou, there was a very concrete discussion about specific matters. We have witnessed a shifting from general topics to specific topics in this conference. Another thing is that, first, there was a very strong characteristic of exchanging information about ourselves with each other. That was actually the main initiative targeted in the first meeting. However, from the second meeting we began to focus on cooperation as well as information exchange. In other words, actual or specific activities have been initiated. We have witnessed a shift from exchange to cooperation. It is my understanding that tomorrow we will see some concrete activities that are in progress, which I am looking forward to. This will show us the change from exchange to cooperation in reality.

Having said that, may I remind you that initially we produced a very rigid statement written in a very formal fashion. But when we moved into discussions there was a relaxed atmosphere. So from a rigid atmosphere we are moving on to a freer forum. I think that is an important step. Additionally, we have seen change toward a more global inclusion. For example, we have here a representative from Habitat. As for me, I am assigned here from the New York Headquarters. Also, Habitat is now dispatching people worldwide. This summer, a Habitat office was established here in Fukuoka. I think this is a significant change we are observing.

In regard to city issues and problems, of course these problems are quite diversified. At this time we have focused on waste management which is very important. It is vital to look to environmental issues as well as social issues and problems. I believe these issues will be discussed more and more in the future. We need to have specific collaborations, institutions, and systems, based upon a strong network. And I think the United Nations should take part in such efforts so that our mission is further realized. This participation would be mutually beneficial. I think the benefits are great, so I do hope that we can continue to take part in this kind of process. Thank you for letting me share some general comments. Now, if anyone has any comments or questions, please.

Mr. Zhang Yi (SHANGHAI)

Shanghai is still developing, is one of the developing cities you mentioned. In regard to waste management, compared with the other participants, I think we are far behind in Shanghai. As far as we are concerned, this kind of opportunity is very important and through the kind of discussions we are having today we learn many valuable lessons. This a great harvest for us to appreciate. Waste management is faced with a lot of challenges in Shanghai and we are defining our plans. In doing so we would like to correct specific problems, one by one, including incinerator construction and others. Financing and technology and management and operation are some of the many problems we have to address. I believe Fukuoka has a lot of experience with these issues. I wonder if you could make further contributions by sharing your observations and experiences, both pro and con, in managing and operating waste. And I wonder if it would be possible to send delegates to Shanghai on a kind of study tour to fully appreciate what is going on in Shanghai, what we do in the process of waste management. On this occasion, once again, I would like to thank the organizers of this conference for everything you are doing for us. And I do hope that we can have closer and more specific exchange and cooperation from now on. I trust that in this process all will benefit. Thank you.

Mr. Phan Manh Hung (HO CHI MINH)

We, too, came to this conference and learned of the problems and experiences of other countries in Asia. The problems we face in waste management in Ho Chi Minh City are similar to other countries. With great thanks to the representatives from the four presenting cities in Asia, that's all.

Mr. Park Nam Bae (PUSAN)

I have a question for the person from Habitat. In your waste management computer programs, have you developed a software that aids in reducing costs. For the processes of solid waste management, it seems there might be some software capable of this. My comment to Habitat is will you develop a system or software to calculate costs so that we can reduce costs of waste management?

Mr. Graham Philip Alabaster (HABITAT)

Thank you for your question. There are plans afoot to take the development of this software a stage further and to update it and upgrade it. In its current form it is a very simple computer program but it has found some use for predicting expenditure and projecting costs. But we do need to work on making it a bit more user-friendly, we need to write it in a newer program. There are plans to do this if we can find sufficient support. So in answer to your question, we do want to see this software upgraded but it is available freely to anybody who wishes to use it and try it out in their situation. If anybody has any requests about this or any of the other projects that are mentioned in the paper, I would refer them to contact the Fukuoka office and we will do everything we can to furnish you with what you request. Thank you.

Mr. Tan How Khiang (SINGAPORE)

We really appreciate attending this conference and the feedback we get from you is very valuable for us and Singapore's high standards of waste management. At present the waste management system of Singapore is corporatized. The service is corporatized but the disposal is still managed by the Ministry of the Environment. At present, the corporatized companies have been given a monopoly status, for the first two years, to manage the municipal base. After the expiry date, it is likely that the waste management industry will be opened to tenders. Disposal of refuse is managed by the ministry, the local governments. At present Singapore has three incineration plants and one transfer station and our dumping ground will be phased out most probably next year. Then we will move to an offshore island landfill. That's a brief summary of our situation.

Mr. Kazuto Kakoi (KAGOSHIMA)

In Saga, we have finished some landfills but after the landfilling is completed there is gas generation, and we are trying to collect and burn the gases. For landfilling sites which are still being filled, we try to discharge gases into the air. There is discussion on carbon dioxide and other gases in the city council and it is very difficult to treat those gases generated at the landfill site.

Mr. Michio Isono (FUKUOKA)

We have three landfilling sites in Fukuoka City. For those landfilling sites, we are now dumping waste there and we try to discharge gases. We have some special equipment so that we can collect gases and discharge them into the air.

Prof. Yasushi Matsufuji (FUKUOKA UNIVERSITY)

There are many issues and it is very difficult to address this simply or briefly. For one thing it is necessary to analyze the gases. What are the gases? For example, is it methane gas or it is carbon dioxide? We have to have more detailed information on the gases. Basically, in Japanese landfill sites, we try to have aerobic landfilling and most of the gas generated is carbon dioxide. There were some presentations which mentioned methane gas, which can be collected and used as a bio-gas. It's efficient to convert methane gas into carbon dioxide. Methane gas has an energy which can be used. However, for the City of Kagoshima, I don't know the composition of the gases. Do you have a sufficient amount of gas to reuse as a source of energy? Basically, it's better to have aerobic landfilling where carbon dioxide is the gas generated. It is more economical in the case of Japan. Also, while landfilling is active, there is a fluctuation in gas generation. If you want to collect gases, organic waste must be separated from inorganic waste. However, because executing separation is difficult, decomposition in an aerobic condition with appropriate measures for gas is a realistic approach to take.

Gas incineration or landfilling, whatever the methods are, methane gas or carbon dioxide will be generated and we have to balance this gas production against the warming of the globe. We have to reduce the warming effect of the gases. Carbon dioxide is more efficient in terms of management. However, if there is a lot of organic waste dumped, one option is to produce methane gas so that it can be used or reused as bio-gas. Tomorrow you are going to visit a site where we have such a program, so that you can experience how to deal with this issue in a very economical matter. So you can get more information tomorrow afternoon.

Mr. Ian Maxwell (AUCKLAND)

We saw earlier a video from Fukuoka which was part of a public relations program to promote recycling. I'm sure many of us are involved with programs targeting recycling, targeting the way people's attitudes towards waste can be changed. And I suppose my question is initially directed towards Fukuoka. How successful have those programs been? And are there any ways that you have discovered that you can actively monitor and measure the effectiveness of those publicity campaigns?

Mr. Tetsuro Tsuruoka (FUKUOKA)

Public relations activities do promote citizens' recycling and reuse efforts. In Fukuoka, we have 2,400 communities or neighborhoods. Five hundred households serve as community leaders, as promotion committee members, and they act as bridges between the community and the city. They try to disseminate information such as how to dispose of garbage and waste and how to promote a recycling attitude. This is a kind of a grass roots activity by the people of the community. This is one thing we are introducing. The second thing is that we need wider participation by the citizens. That's why we use video clips and we have TV advertisements or articles in newspapers and newsletters. Also, environmental education should be given to children. We have environmental education classes in grade schools. We introduce these classes in the fourth grade and there is a booklet prepared by the city. It is called "Waste and Our Lives." It details how to recycle waste and how waste and garbage is treated and disposed. Students learn about the process and sometimes they visit the collection activities, dumping activities, or incineration plants, so that they feel that this is their own problem. If citizens don't follow the rules and regulations, it is a serious problem. This is what they learn in the fourth grade. Another activity is in the supermarkets. There are various containers in the stores for collecting bottles and cans and formed plastic trays. These are present in the supermarkets so that the citizens will see the activities and they will return plastic bottles, bottles, cans and the trays. It is important to have the involvement of all the citizens, not only the adults but from children to adults. Does this answer your question?

Mr. Zhang Yi (SHANGHAI)

After listening to the representative from Fukuoka, I have a question. Waste management requires citizens' cooperation. Shanghai has many projects so that citizens will participate. Citizens are supportive of the government's activities. Still we have to do more to educate and enlighten the citizens. I saw the video clip from Fukuoka City. It was very good material, I thought. What I want to ask you is: is it possible

to get a copy of that video clip so that we can use it as a model?

Mr. Tetsuro Tsuruoka (FUKUOKA)

Today's video clip was a visual presentation and it is a kind of a cartoon or animated clip. This is for grade school students and junior high students. I think adults will also enjoy looking at it. We have a Chinese version and a Korean version, so I will give you a copy of the video clip if you want. I have to check whether we have sufficient numbers available but if you tell us you want to have it, we may be able to prepare a copy for you.

Mr. Minoru Harada (NAGASAKI)

I have listened to the discussion. At landfilling sites there are problems of water pollution, odor, bad smells. We have to reduce the number or the size of the landfilling sites. This is what we have been discussing. Then, if you reduce the number of landfilling sites you have to build incinerators. Of course, this will reduce the volume of waste. This is what Japan did. Incinerators will however, produce air pollution and there will be problems of dioxin. So, as Mr. Graham stated, we have to have environmental management. We have a framework for environmental management. What I want to ask JICA or the United Nations is to develop a system or software on environmental management. What do you say?

Mr. Toshio Kinoshita (JICA)

Concerning the comments, this is what JICA has been discussing and I believe that we have to have an overall environmental management program. We want to reinforce the programs so that we can manage the environment globally. We are cooperating with developing nations in developing policies and we are trying to incorporate software and ideas and know-how so that each nation will have better programs and systems for environmental management. We will have more of that kind of activity and we are prepared to cooperate with you in developing the systems, overall systems, for environmental management.

Mr. Graham Philip Alabaster (HABITAT)

I think this is a very important point and I think that the only way we can begin to make progress is to try and quantify the costs to the environment of these problems. I gave a very clear, graphic example of the costs that resulted to the Indian economy from the plague scare and that's the only sort of language that a lot of people understand when it comes to the environment. We have to, in some way, try and quantify these costs and develop management systems, and software

is a very good example, to enable city managers who are involved in environmental protection to realize exactly what the benefits and what the problems are with the environment. Thank you.

Chairman

Thank you indeed. Any other comments? If not, I would like to conclude our free discussion. After this we are going to have Dr. Matsufuji of Fukuoka University wrap up this session, but I believe he will need some time to prepare for that. So I propose that we have a break for 15 minutes.

Meeting Summary ||||||||||||||||||

Prof. Yasushi Matsufuji
Faculty of Engineering
Fukuoka University

Chairman

Now we would like to resume the conference. We will have Professor Matsufuji from the Department of Engineering of Fukuoka University give us a summary of this meeting. Professor Matsufuji will accompany you on tomorrow's field work trip. Now, Professor Matsufuji, please.



Prof. Yasushi Matsufuji (FUKUOKA UNIVERSITY)

Thank you very much for your introduction. I am Matsufuji from Fukuoka University. You must be tired after a long day. I will make a brief summary of today's conference, including my impressions and comments. My first impression of this working level conference is that city representatives from local government or local authorities have participated in discussion in a very candid manner. Indeed, in the open discussion we saw a very free discussion. Usually discussion tends to be formal, however, in this working level conference we had very frank and candid opinions regarding waste management especially collection, transportation, treatment, and disposal — four processes. The processes most discussed were collection, transportation, and disposal. Also, we heard presentations from four cities. In my impression, it seems each city has a specific master plan and I was assured that each city has taken the first steps in their own master plan. All the participating cities have been witnessing rapid economic growth. Therefore, in the year 2000, it will be necessary to review these master plans. But what is most important now, is that we have the long term, mid-term, or short term master plans for waste management which