

Subsession 3

City and Environment/Public Health

Chairperson (Mr. Kazuo Kanado, Director, Management Dept., Fukuoka City)

We now will commence Subsession 3. The 8 participating cities in this subsession will be, Saga, Fukuoka, Hong Kong, Ipoh, Jakarta, Kumamoto, Manila and Miyazaki. We would like to have Mayor Masatoshi Nishimura of Saga City act as Chairman and Mr. Masataka Hanashima, Dr. Eng., P.E. Professor, Fukuoka University to act as commentator. Your understanding in our nomination would be greatly appreciated. Mayor Nishimura, we wish you would chair this subsession, please.

Chairman Nishimura

Thank you very much. I will be acting as chairman. I hope the discussions in this session will help to achieve the goals of this Summit: to create harmony between city development and the residential environment. Thank you for your cooperation. I would like to ask Saga City to give its presentation first.

PRESENTATIONS

SAGA |||

Mr. Masatoshi Nishimura

Mr. Masatoshi Nishimura, Mayor of Saga

Please look at this slide. The problem of garbage disposal is one facing every municipality in the nation. In conjunction with the remarkable economic growth, the new trend of mass consumption was born. This has led to the squandering of limited, precious resources, production of large quantities of garbage, illegal dumping of waste, and empty cans littering street corners. The land has become poisoned, the water dirtied, and the atmosphere polluted. The destruction of the natural environment, which provides the necessary foundation for life, has brought about a life or death crisis for the mankind. Facing this dire condition, we aim to foster new awareness among the citizenry to conserve natural resources, and pass on clean environment to the next generation. Every year, the amount of garbage produced has increased by 5 to 6%. In 1989, 75,500 tons of garbage were collected (210 tons per day). The disposal of so much garbage cost Saga City JY8,000 per person or JY5 million per day.

Saga City garbage disposal facilities include: One is Saga City Incinerating Center, Incinerating capacity - 225 tons per day, and we also have a landfill which has a sewage plant, and the size is 180,000m² capacity. Completed in 1981, the Incinerating Center

has 3 incinerators. Due to the increase in the amount of garbage, as well as the change in the composition of garbage, these incinerators may need reconstruction or replacement soon. The landfill currently in usage will have run out of space in ten years. With this feeling of emergency, the fight against garbage was begun.

As the first step, in January of 1990, college professors, community associations, women's organizations, and related business leaders met to create a comprehensive strategy to deal with the garbage disposal problem. The opinions and ideas expressed during that meeting were incorporated into the following municipal policies:

In April of 1991, the city authorities instituted a new garbage sorting program for the entire city. In other cities, plastic materials get classified either as burnables to be incinerated or non-burnables to be buried in landfills. Saga's policy of collecting only plastics together is quite unique. We aim to spread citizen awareness through slogans such as "You are in charge in this fight against garbage!" and "If you mix, it's garbage; If you sort, it's a resource." The six types of garbage are classified as follows: burnables, non-burnables, garbage containing harmful substances, oversized garbage, recyclables, and plastics and styrofoams. In order to request understanding and cooperation from the residents, the city authorities held an explanation meeting at each of the 326 local community associations. Three months after instituting the program, city employees and city council members led a rally at the garbage collection site. Since the implementation of the sorting policy, the amount of garbage was reduced by 17% in 1991, but began to increase again from the latter half of 1992.

These are some activities designed to promote citizen awareness. Distribution of garbage pick up schedule and detailed explanation of how to sort garbage to every household in the city. 3rd through 6th graders at the elementary schools in the area pick up and compact littered empty cans. While involved in an outdoor activity, the students learn about environmental issues. And also there is environmental family, parents and children campaign, groups of parents and children gather together to pick up litters on the streets. Participants not only clean the streets, but they also tour the nature spots in the city, the garbage collection center and attend symposiums concerning environmental issues. This program is designed to raise not only the participants' environmental awareness, but their morale as well.

In June of 1992, a recycling project, carried out by the third sector, was begun. Nine private corporations, together with the city, established the Saga Resources Recycling Center, Inc., which selects items from the recyclable trash and sells the reusable materials. The center is funded with a JY34 million trust charge from the city and the profits from the sale of recyclable materials. In this way, not only is recycling effectively promoted, but the center offers a place of employment for the elderly and the disabled people.

In September of 1993, the Anti-litter Ordinance was enacted. The ordinance is aimed at keeping public spaces clean and establishes the 50 hectares "Model Area" near the Saga Station. Furthermore, patrol teams check on the state of litter on the streets, clean the neighborhoods, and carry out various anti-litter PR campaigns. Through the various projects described above, the garbage reduction efforts have borne fruit, and thanks to the enthusiastic cooperation from the citizens, and the garbage sorting has become widely practiced.

Problems encountered by the city in its efforts are :

The incinerators currently in use have only 5 years of use left. The cost of new incinerators, planned to be completed in 2001, is over JY25 billion. This will place a heavy financial burden on the city. It is difficult to secure new sites for landfills, because residents do not want to live near them. Due to the drop in the price of scrap materials, the management of the Resources Recycling Center has become difficult. Saga City is currently examining the following schemes to reduce the amount of garbage being produced : To collect only the garbage placed in city approved bags. These bags would be sold by the city. To use EM bacteria to turn raw garbage into compost. Even if successful at reducing the amount of garbage being produced, the problem of garbage disposal will not disappear. It is an ongoing problem. Perhaps, we can remind the people to use the now almost forgotten word "wasteful" and practice the frugality of the olden days. The garbage problem is one which faces each and every resident. Yet, thinking only about oneself will not solve the problem. Fortunately, the people of Saga still possess the willingness to work together as a tight knit community. Residents lead sorting garbage system alternately at the collection site in the community. Neighborhood cooperate against garbage problems. Neighborhood also cooperate to build a new and integrated form of community. For example, the furnishing of flower pots on the sidewalks along the Symbol Road leading from the train station has allowed the citizens to participate in the beautification efforts. Presently, through the "Flower Talks" project, the creation of a city filled with flowers is underway.

Perhaps, one of the reason that the people of Saga work together as a community so innovatively is that Saga is the leader in Kyushu in the fight against the garbage problem.

Yet, this problem requires a national solution. Through our interaction with the citizens, we local government have come to understand that measures such as requiring plastic manufacturers to collect plastic garbage, making usage of recycled paper mandatory, and taxing the usage of virgin resources need to be enacted by the national government to solve the problems.

Lastly, the problems involving garbage disposal and the environmentalism as a whole are global problems. Saga City recognizes that from here on it must act as a member

of the Asian community and as a member of the world community. We look forward to working together with everyone here to solve the international environmental crisis by "thinking globally and acting locally." Thank you very much. (Applause)

FUKUOKA |||||

Ms. Atsuko Kato

Chairman Nishimura

Next, I would like to request Ms. Atsuko Kato, Deputy Mayor of Fukuoka City, to speak.

Ms. Atsuko Kato, Deputy Mayor of Fukuoka

Thank you for the introduction. My name is Atsuko Kato, Deputy Mayor of Fukuoka city. I would like to focus on the waste treatment plans as a part of the environmental policies of Fukuoka City.

We have a population of 1.27 million at present, and 2,000 tons of waste is collected every day. Through effective incineration and sanitary landfill, the government now can provide a clean environment for the citizens. This has been made possible by the government, which began implementing a variety of plans for sanitary waste treatment many years ago. Under current conditions, however, with the rapid increase in waste and rising citizen interest in the global environment, the government is being asked to address issues such as waste reduction, recycling, and city systems for energy recycling, as well as sanitary treatment. In this presentation, I would like to introduce new goals for the future, as well as the results of the past projects.

The amount of waste generated in Fukuoka City is increasing along with the population. Over the last ten years, the population increased 12%, and waste showed an increase of 48%, four times larger. In the 1890s, waste used to be collected by horse-drawn carriage. It was in 1957, about 35 years ago, that we started to use trucks. Later we established a system whereby waste is regularly collected at night, and then collection was consigned to a private company. It was an remarkable idea at that time. As a result, traffic jams in the day time were resolved, the scenery of the city was kept attractive, and at the same time the efficiency of waste collection was greatly improved. At present, waste materials are separated into three groups: combustible, non-combustible, and large waste, and are collected at night time by a private company under contract to the government.

We constructed our first waste incineration facility in 1926. This slide shows the one operated 30 years ago. We constructed a disposal plant with the latest technology in 1972. In 1981, we also constructed three plants in the eastern, western and southern parts of the city to handle all city waste. As shown in this slide, we currently have four incineration plants around the city, and are planning one more to handle to the increasing amount of waste. We also have adjoining facilities at the eastern and western

plants which crush non-combustible or large-size waste to recover valuable materials, such as steel and aluminum, for recycling. The new plant is scheduled to offer the same functions.

I would like to introduce the plants and facilities tomorrow.

Wastes are eventually processed into a landfill at the present. We prepared the first landfill in 1961. In 1973, the landfill style was remodeled with waste water pipes embedded at the bottom in order to ensure stabilization of the sites. At present, we adopt the semi-aerobic reclamation style as shown in the slide. Although we have two sites in the eastern and western parts of the city, they will reach capacity soon. We are trying to systematically prepare new landfill sites from a long-term viewpoint. After the sites are completely stabilized, they are effectively utilized for parks, schools and other public facilities in accordance with a comprehensive plan.

The building in the slide is a ward office constructed on a landfill site.

As expressed by the theme "Think Globally, Act Locally," the global environment is recently the main subject among the environmental problems. Fukuoka City hosted the Club of Rome Conference in Kyushu in May 1992, with the theme "Global Environment and Local Action." It was the first time that the Conference had been held in Asia, and it was highly successful, with active exchange of opinions. With the Fukuoka Declaration adopted on the last day of the Conference, Fukuoka has been expected to become a model city for local action to improve environmental problems. In the following June, the Earth Summit was held in Brazil. We reported the results of the Conference in the World City Forum at the Summit and requested solidarity of the participants. This is a picture of me giving a report in Curitiba City. Under the Fukuoka Declaration at the Club of Rome Conference, the government and the citizens began cooperative implementation of environmental preservation projects. As the first action, representative citizens in every field made the "Fukuoka Citizens for the Advocation of an Environmentally Friendly City" declaration, with many citizens, businesses, and administrative organizations promising to take actions to resolve environmental problems responsibly. The citizens in the slide are announcing the declaration.

Moreover, to make Fukuoka an environmentally friendly city, we have established the 14th day of every month as Environment Day. The citizens are asked to spend the day with consideration for the environment, through promotion of recycling activities and greenery preservation, and environmental education at elementary schools using texts.

Recently, it has become necessary to reduce the environmental load through recycling and the amount of discharged waste itself, as well as to improve sanitary treatment. In Japan, there are laws regarding utilization of recycled materials, waste materials, pollution prevention and environmental preservation. In addition, Fukuoka City has

"The Ordinance concerning Waste Materials Reduction, Optimal Waste Disposal" and "The Ordinance concerning Prevention of Littering with Cans and Bottles and Their Recycling." In one concrete project, the citizens are promoting waste reduction and recycling under the slogan "Let's Reduce Garbage by 100 grams per Day." Environment-oriented projects include waste reduction projects at offices, which are implemented by the managers of the buildings, waste reduction and recycling projects at shopping arcades, and designation of eco-shops with the "Karl Mark" which promote waste reduction through the use of simple packaging. This slide shows a shop with the "Karl Mark." Local resident groups voluntarily collect reusable materials for recycling. The government dispatches a truck with a can-pressing machine, to assist in the separation and recycling of waste cans. This is the truck with the can-pressing unit. Non-reusable waste materials are incinerated and re-utilized as thermal energy. The energy is supplied to public facilities such as welfare centers for aged people, or used for power generation for treatment facilities and pools. Extra power is sold to the electric utility, and generated an income of US\$ 3 million in the last fiscal year. Moreover, we opened the Recycle Plaza, using a part of the building of the former incineration plant. It is utilized for a variety of activities by the residents: exchange of clothes and books, postcard-making using milk cartons as materials, soap-making from waste oil, hands-on training in recycling, and education of volunteers. It will be introduced tomorrow.

We have laws in Japan which define the responsibilities of entrepreneurs for industrial waste treatment. To re-utilize such waste materials, concrete chips and asphalt chips are processed through intermediate treatment and used as the base materials for roads. We have a plan to establish a public corporation to construct treatment facilities for industrial waste which concerns the general public. As mentioned before, the goal of the government is changing from "optimal treatment and disposal of waste materials" to "establishment of recycling-oriented society which treasures resources." To achieve this goal, the cooperation of the residents, businesses and administrative organizations, guided by their awareness that we are all citizens of the Earth, is indispensable. In our city, we are making efforts through a variety of discussions and forums such as the Waste Reduction and Recycling Conference. As an example of the projects which we are promoting with neighboring cities, I'd like to introduce "Respect the Earth--Let's Clean up Kyushu." In this project, executed on Environment Day, the citizens of 201 groups in the Kyushu-Yamaguchi region clean up their local regions. This year about 600,000 citizens participated in the project, and collected 1,900 tons of trash on the beaches.

Pusan City also cooperated in the effort this year. We'd like to express our appreciation here again.

This slide shows the citizens picking up trash.

I think mutual understanding and cooperation with other Asian countries and cities, through international exchange like this Summit, is important. Recently, the global environment is experiencing many problems: destruction of the ozone layer, acid rain, water and air pollution, and increasing amounts of waste materials. To hand down a sound environment to the next generation, we must expand the movement aimed at achieving an environmentally friendly city throughout the Asian-Pacific region, with a global viewpoint. Thank you for your attention. (Applause)

Chairman Nishimura

Thank you, Ms. Kato. Regarding the waste treatment issue, she introduced concrete plans, current conditions, and future plans. Sponsoring the Club of Rome Conference must have been a valuable experience for Fukuoka.

HONG KONG |||

Dr. Leung Ding Bong, Ronald

Chairman Nishimura

Next, we'd like to request Dr. Leung Ding Bong, Ronald, Chairman, Urban Council of Hong Kong, to speak.

Dr. Leung Ding Bong, Ronald, Chairman, Urban Council of Hong Kong

Ladies and gentlemen. Hong Kong is situated in a region where epidemic diseases were are are prevalent. In past times, malaria, cholera and their infectious diseases regularly wiped out thousands. These recurring cycles of disease forced the government to establish the Sanitation Board in 1883, which later became the Urban Council, which I chair. Early efforts in providing some public toilets, bathhouses, night-soil collections, death disposal, refuse collection and other basics were all seen as disease prevention measures. Even these limited efforts were often frustrated by insufficient facilities. For example, in 1939, it is thought there were 500 thousand streetsleepers. Huge squatter areas existed until recently in which people lived in basic and unsanitary conditions. Today, thanks to our world's largest public housing scheme, squatters will become a thing of the past.

In the critical area of food hygiene, however, we have always been able to exercise a high degree of control, both because of Hong Kong's size and our reliance on food imports with approved certificates. As part of this, from close of World War II, abattoirs became a government monopoly, hawkers were licensed, public markets were built by the Urban Council and a comprehensive system of licensing and inspection of food businesses and restaurants came into being. These measures, together with a reasonable system of Government funded medical care dating from 1874, provided a good starting point. A number of other issues, however, were only more recent focus. Hawking. This

problem, although reduced, we still have a very serious hawking problem in Hong Kong. When refugees flooded into Hong Kong from Mainland China during the 50s and 60s, the administration, in a sense encouraging it, saw hawking as a substitute for social welfare to these peoples. Today, hawking with its low overheads is a very lucrative occupation. We have rehoused hawkers into our purpose-built markets, but the hawkers prefer to trade on the streets. We have tried to bring them under control by licensing 11,000 of them. Now here is a group of on-street licensed hawkers which a marked off area on the street. You see them trading more or less orderly fashion. But 8,000 illegal hawkers remain, as in this picture. These unlicensed hawkers will cause a lot of obstruction to pedestrians and to motor vehicle highways. The difference between the two groups is immediately apparent. The development of public markets, changing buying habits and the competition from shops and supermarkets are, however, gradually having an impact. Five years ago, we had 10,000 unlicensed hawkers, and we hope in the future to reduce this record. Public cleansing. Street cleaning is a major commitment. We make use of both very old method such as a human brooming and the dustbin. We deploy about 3,200 manual streetsweepers everyday. And we make use of a very modern technology, as in this picture shows a street washing vehicle. We have allowed of this vehicles with our council.

Encouraging people not to litter has been the task of Hong Kong's twenty years of Keep Hong Kong Clean Campaign. It has involved massive publication, educations, public involvement, and enforcement. Making allowance for our population's density, Hong Kong today is a relatively clean city. Next, waste collection. We collect waste from 430 strategically placed refuse collection points as shown in this picture. It's the entrance of a refuse collection point. And we have 380 specialized vehicles collecting refuse at least once a day. This is a refuse collection vehicles on the picture. And where necessary, many more times a day according to the refuse law. Our standard refuse collection vehicle is rated for six tons refuse capacity. Primarily, disposal out where the waste transference stations. And we still have incinerators, but the old fashioned ones. We have now been building sanitary landfills. But the shortage of land in Hong Kong is creating problems, as with other cities. Public toilets. Until three years ago, the more than 300 public toilets in Hong Kong left much to be desired. This is the entrance to an underground toilet with poor ventilation and poor lighting. We are now in the process of upgrading all public toilets. And new facilities are well designed. Here is a recently completed public toilet built according to the new standard and design. And this public toilet is in Victoria Park, the largest park in Hong Kong. Two years ago, we organized a public toilet design competition. And it was a tremendous success, arousing the attention of the public and the architects' profession. We have worked very closely with our friends in the Japan Toilet Association on this topic.

of waste has been increasing steadily at an average rate of 2.4% annually. We spread prejudice to the ABC plan formulated by the Ministry of Housing and local government in conjunction with the Clean and Beautiful Campaign. Ipoh City Council has been successful in its labor intensive system of waste management. It has been known in Peninsular Malaysia in the 1960s that Ipoh was one of the cleanest towns in the country. Solid waste management in Ipoh City is being administered by the Urban Services Section which is under the jurisdiction of the City Health Department. Ipoh City Council practices the system of collection, transportation, and final disposal method. All waste generated is being collected daily within the city proper, and on alternate days in the outlying areas. In the year 1993, the Urban Services Section was allocated 10,272,140 Ringet Malaysia for its operational expenditures. This is about 9% of the total budget of 104,930,820 Ringet Malaysia. This excludes expenditure increasing new vehicles and other items. Under the collection, transportation and disposal of solid wastes, Ipoh City Council by law, waste is classified into four categories: household wastes, matter generated from a house, but that not include garden refuse; garden refuse includes leaves, grass, creepers, tree branches from garden or lawn from any house; commercial wastes, wastes generated from any commercial activity; industrial waste, waste generated from any industrial activity. Hazardous and toxic wastes is classified under the Environmental Act of Malaysia, and it is regulated by the Department of Environment.

The Council takes the responsibility to provide services for the collection of wastes scheduled as follows: residential wastes, door to door collection on alternate days; commercial wastes, daily, nightly collection from door to door; industrial wastes, service is provided upon application with minimum charges levied; green and backyard wastes, once a month according to schedule.

The site for the disposal of wastes is situated at Bercham, 17km away from the city center. This council is practicing control tipping at a former mining pool area.

Data of control tipping site -- the area is about 10 hectares, lifespan, approximately 2 more years, total amount of waste received daily is 300 to 350 tons, cover soil being purchased at 6 Malaysian Ringet per cubic yard, usage per day is 480 cubic yards. Problems accounted, like a plane first now to do research and development programs towards a better and systematic approach in solid waste management as resulted in ad-hoc action to problem solving. This has been recommended, but followed in the national program on solid waste management and also in the report of technical cooperation Malaysia and Germany in the year 1991 in preparation of a solid waste management master plan for Ipoh for the year 2010.

Very labor intensive. The collection system needs a large work force. The daily attendance of workers tends to decline due to their unwillingness to embark in this profession. This leads to a disruption of collection services. Each collection team is assigned to

collect 1,500 to 1,700 households daily. Speedy collection is hampered by the uncooperative of the residents. Nearly 30% of the residents do not use standard type of the dustbins stipulated by law for the domestic waste storage. Domestic waste is not taken out in time for routine removal. Indiscriminate disposal of waste. Household and commercial waste are being dumped indiscriminately on vacant land, roadside table, and open areas for quick and easy disposal. This leads to constant complaints of nuisance. Vehicle breakdown. The frequency of vehicle breakdown is rampant. This is due to shortage of vehicles, usage of old vehicles, vehicles overstrained as they are being used to cope with the services. The disposal site has become an environmental issue due to the improper maintenance. With proper planning and placement of funds in the purchasing of cover soil, the situation has changed for the better. Steps are being undertaken to transform this control tipping site into a sanitary landfill by making necessary improvements.

With the formulation of the master plan for solid waste management in Ipoh City, there is a need for the introduction of intermediate treatment of solid waste before final disposal. Permission for disposal ground is becoming harder to obtain. The Council has the option of intermediate treatment such as composting and incineration. But with the failure of cities that adopted composting, incineration has become the first priority for adoption by the Council. Two incinerations with 300 ton capacity, each will be adequate for the city requirement and waste products from factories. Several visits by relevant officials on the Council have been made to countries with these facilities and technologies. The Council has plans to build a sanitary landfill for the disposal of non-combustible waste as well as ashes and residue from the incinerators. In conclusion, Ipoh City Council is stepping up its management in the disposal of solid waste. The state and federal government are giving priority to solid waste management have diked up all priorities to plan for the future. Technological assistance from develop nations like Japan, we hope to have cleaner environment for our residents. Thank you. (Applause)

Chairman Nishimura

Thank you very much. His presentation covered the progress and current conditions of the waste treatment system in Ipoh, and present problems and future programs. As mentioned in the presentation, Ipoh City hopes to create a more sanitary environment with technological support from industrialized countries. We, the participants in this session, should consider this issue fully.

and etc.

Now the role of scavengers in recycling process, next slide please, much of the population growth in Jakarta is contributed by people who migrants from outlying villages. From the viewpoint of their social economic states, they fall into low income group and live in a slum areas. The government is not yet able to provide sufficient job opportunity for such people and as a consequence, they find employment in various informal sector activities such as peddling, parking attendants, or at-home industry, etc.

Now scavenging is one of these informal sector activities. And employs between 20,000 to 40,000 persons. You see the scavenger activity flows shown in the illustration. Most of them are ex-farmers, elementary school graduates, and unskilled workers supporting their families in their villages. Because of the above reasons, they try to spend as little as possible in the city in order to save their money and send it back to their villages which are located around 50 to 100km from Jakarta. These scavengers often create a negative impression of the human value because they live at disposal sites. However, from the viewpoint of the economy, their economies are surprisingly high by local standards, ranging from 50,000 Rupias to 400,000 Rupias per month. They spend only 30 to 40% of their income and the remainder is saved and sent back to their villages.

Next slide please. The scavengers' activity flow can be illustrated as follows. The scavengers collect inorganic wastes such as plastic, metal, glass, paper, leather, wood, etc. from various sources from where it is taken to temporary disposal sites, then to transfer station and on to final disposal site. Recycle level wastes are sold to "LAPAK", which is also shown in the illustration. On a cash basis who sort un waste, and then sell it to an Agent, who in turn sells it to factories to be processed to produce the goods for household, office, etc.

Next slide please. Now I come to the technical matters. The condition of solid waste generated in Jakarta amounts to 24,000, 25,000m³ or plus minus 6,000 tons daily. Eighty three percent of this total amount is transferred to final disposal sites, and the remainder being handled by people themselves such as for landfill, composting, etc. The solid waste composition in Jakarta consists of 73.92% organic and 26.08% inorganic wastes.

Next slide, please. 65.9% point of water content, 15.82% of ash and 1,252kcal/kg.

Next slide please. Now those are the composition of the solid wastes which can be shown. Now I'm forming the coming slides, next slide please.

Since the formal employment sector is not yet sufficiently large in Jakarta to meet employment needs, government attention is still being given to the existence of the scavenger. While government is not involved directly in the existing thing of business, it tries to protect the team by prohibiting inorganic wastes being imported from foreign

countries. Also government effort is directed toward training and guidance to protect them from dangerous waste and contagious diseases.

Now this slide is showing you that the government also provide the transference region of the solid waste handling. Next slide please. Here is the sanitary landfill facilities which was prepared in 1990. Now in order to reduce the volume of waste, government has tried to process waste in situ such as providing the assistance for scavengers, to produce inorganic wastes into composting. This can increase the income of scavengers besides creating new job opportunities in slum areas. In the long term, the government intends to continue its efforts in parallel with the country's economic growth to establish more effective solid waste recycling and to provide the optimal benefit for the local inhabitants as well as the environment.

Now, next slide please. I come to the final of my presentation. Next slide please. These are all the illustrations showing to how to practice in Jakarta. Next slide please. Next slide please. These are all the scavengers activity. Next slide. The scavengers again. Next slide please. Next slide please. These are the so-called "LAPAK", which I have explained to you. Next slide please. No these are the result of those recycled material. Now next slide please. Yes, this is also the result of the recycled materials. Next slide. OK.

Now, my conclusion, that this presentation does not illustrate the use of advanced technology in solid waste recycling. However, it does present a picture of efforts towards improving the environment of Jakarta in a realistic way in keeping with the existing social and economic conditions of the people living in Jakarta. Hopefully this presentation can enhance the scope and benefit of this excellent meeting. Thank you very much. (Applause)

Chairman Nishimura

Thank you very much for your presentation, Mr. Aboe Joewono Aboe Prajitno.

He introduced the current conditions of waste treatment in Jakarta, re-utilization of solid waste materials, and the role of waste collectors. We can well understand the importance of small-scale waste collectors in the city.

KUMAMOTO |||||

Mr. Keiichiro Kamado

Chairman Nishimura

Next we'd like to request Mr. Keiichiro Kamado, Director of General Planning and Coordination Bureau of Kumamoto City, to speak.

Mr. Keiichiro Kamado, Director General of Kumamoto

First I'd like to discuss the items covered in the materials in your hands. If time is left, I will add supplementary explanations.

Among the policies concerning the living environment in Kumamoto City, it would be

best to start with a report on treatment measures for waste water discharged in daily life.

First I'd like to mention measures for public sewage, which are very important for a sound, comfortable environment ; pollution prevention in public water areas ; and preservation of the natural environment and water sources. At present, the diffusion ratio of public sewage is 66 %. We are planning to increase it to 100 % by the early 21st century, about 10 years from now. There are, however, places where installation of sewage systems is difficult for geographical reasons or low population density. We are planning to support these areas through the construction of small-scale septic tanks and sewage treatment projects for agricultural villages. For the septic tanks, the municipal government bears part of the cost necessary for installation. 461 tanks were installed by the end of the last year. We estimate that we still need to install approximately 2,500 tanks. For sewage treatment projects for agricultural villages, villages are respectively regarded as single units. Each unit is now discussing the projects for its own area. Currently we have two major problems to be settled in the future. One of them is utilization of water processed at sewage treatment plants. The other is re-utilization of sludge discharged from public sewage treatment.

Since 1976, we have continued to survey and research there-utilization of treatment water, and started to use it as agricultural water in 1985. At present, rice fields of approximately 230ha are irrigated with such water, at the rate of about 30,000m³ per day. We are considering plans to expand the serviced area.

Currently the sludge is incinerated, and then the ash is buried. This means that we must provide sites for burial. We are now investigating whether or not the ash can be utilized as a construction material. Partly because we increased the number of weekly waste collections from two to three, the total amount of collected waste increased 70 % over the past decade. The national average is an increase of 36 %, so our figure is quite large.

Recently, with the cooperation of the residents, waste from homes is tending to decrease gradually. On the other hand, the waste produced from offices continues to increase. We assume that it will increase about 30 % in the next ten years.

We have two incineration plants with a capability of 1,050 ton/day for combustible waste materials. The thermal energy generated by the plants is utilized for heating plastic hothouses, as well as an energy supply for local welfare facilities. Extra energy is sold to the electricity utility. Non-combustible and large-size waste materials are generally land-filled. Reusable waste is separated into groups, such as steel, newspaper and corrugated carton, at private facilities and then sold as reusable resources. To promote waste reduction, we are executing the "Kumamoto Diet 100 Campaign," where residents try to reduce generated waste by 100g per day per person. Through

inspection tours to related facilities, PR videos, panel exhibitions and a variety of events, results are excellent.

We designate transparent bags for scheduled waste collection by the government along regular routes. Transparent bags provide many advantages, including improvement of the manner and awareness of the residents for waste separation, and improved safety for waste collectors. By introducing transparent bags, we were able to reduce home waste 7.2%, and increase reusable materials 46.8%. And also we have a support system for those who install composting equipment for home use. We have two issues to be discussed in the future: complete treatment of plastic materials, and adoption of a charged system for waste treatment. I think that especially the latter issue should be carefully examined by all the local organizations in Japan.

The last thing I'd like to talk about is drinking water for the residents. The drinking water for over one million people in Kumamoto City and the surrounding areas completely depends on underground water. We have established a council with related organizations for preservation of underground water and the surrounding environment. Especially in the case of our city, we are developing forests around the water sources.

Newly constructed municipal facilities adopt systems to effectively utilize rain water. Utilization of rain water is also being expanded in private buildings.

To address the environmental problems, the cooperation of the citizens is indispensable. At the same time, it is also essential that we, the people engaged in administration, cultivate our awareness to flexibly correspond to the needs. Thank you very much for your attention. (Applause)

Chairman Nishimura

Thank you, Mr. Kamado.

He introduced measures for treatment of waste water and waste materials, especially as related to drinking water. The results of the "Kumamoto Diet 100 Campaign" and introduction of transparent bags are excellent.

MANILA |||

Mr. Alfredo S. Lim

Chairman Nishimura

Next we'd like to ask Mr. Alfredo S. Lim, Mayor of Manila, to speak.

Mr. Alfredo S. Lim, Mayor of Manila

Mr. chairman, Ladies and gentlemen, good morning. The city of Manila has a glorious past which the government wants to restore within a service framework of agency, honesty, efficiency, equality and discipline. It is dealing seriously with the concerns brought about by urban growth with the aim in view of making city life more meaningful and enjoyable.

I'll discuss the major efforts of the city government towards city renewal, which focuses on improving the state of environment and public health in the city.

The actions to address the concerns of environment and public health are intertwined with the various projects of the city contained in the city's strategy plan, or blueprint. The implementation of the strategy plan of the city has started by bringing new life to Manila's heritage sites and buildings, particularly in the area of the Walled City of Intramuros. Based on its historic framework, the site is refurbished with buildings and infrastructures unique enough to highlight the distinct character of its magnificent past. Finely designed converted walls bounding the main entrances to the Walled City are now completed. They are likewise fully lighted in the evening, together with the other major thoroughfares in the city. Within the content of a joint city government and citizen initiative, the zonal beautification, greening, we have planted about 50,000 trees, and it's our wish that in front of every house there must be one tree planted, and cleaning programs are spearheaded by ten action officers (heads of educational institutions) in their respective zones. This is to enhance the provision of a safe and clean place to live, while having a good mix of retail, office and entertainment facilities. The Manila Bay and its foreshores are revitalized as tourist and recreational attractions, becoming more alive with joggers and promenaders. Ermita District has already been rid of honkey-tonks and illegal funhouses.

The biologically dead Pasig River and other river canals are being restored to become another major focus of life in the city. Flood control and drainage systems are undergoing renovation, while anti-pollution drives are also enforced. Squatters are relocated and some squatter relocation sites upgraded, like the Smokey Mountain, once an eyesore in the city. Smokey Mountain is no longer a dumping site, and in its place will rise modern tenement houses and industrial zone. Low cost housing units, although still limited, are made available. Parks and other playgrounds have been renovated and improved. To take care of the health of the people, sanitation in public eateries, public markets, public comfort rooms and Manila streets is strongly enforced. Garbage collection and paper waste management are intensified to instill the zero garbage scheme. Manila is the only city where free medical services are extended to the people. When we say free, it's free rooms, free medical examination, and free medicines. The free hospital services of the city have been upgraded, and expanded from the original Ospital ng Maynila, now a medical center, to the Sampaloc Hospital and Tondo District Hospitals. Additionally, the city operates 44 health centers, 14 lying-in clinics, six community reference infirmaries, geriatric clinic, a VD and AIDS clinic, and a laboratory diagnostic clinic. In the 98 public elementary and secondary schools, free education and medical and dental clinics are maintained free of charge.

The private sector has demonstrated support in providing nutrition program for the

children. Campaign for a health-conscious Manila, like anti-smoking. Extreme smoke belching is going on, while theaters and dormitories are regularly inspected to reduce health hazards to the public. Community residents, including the youth, are mobilized in almost all of the community based projects. This practice increases the people's awareness to participate, and therefore, not be dependent on mere doleouts from the government. We request the public to sweep the frontage of their houses at least ten minutes a day in the morning.

The city is enjoying the support of practically all sectors of the population. The Mayor's Office has succeeded in coordinating its efforts with the various non-governmental and civic organizations in the shared vision to pursue the preservation and future development of Manila. Given the various programs and services made available to safeguard the environment and health of the people, the only major problem is, as I said yesterday, is the resources. Certainly there is not enough to finance all that have to be attended to at any given time. Much as what government wants to do, there is always the constraint of money and time. The solutions to the problems in the city give rise to other problems, causing chain reactions. But these are challenges that the city government is committed to pursue.

The city of Manila firmly believes that our people are the backbone of the city's growth and development. We therefore take good care of their welfare by working for a safe and healthy environment. Even as we feel the pain of having a scarce resources, in the meantime, we encourage our people also to continue to do their share. Government can only do so much. People and the government must help each other. Thank you. (Applause)

Chairman Nishimura

Thank you very much for your presentation.

He introduced city development projects which stressed improvement of the environment and public health. I was very impressed with their sincere effort under such severe economic conditions.

MIYAZAKI |||

Mr. Shigemitsu Tsumura

Chairman Nishimura

Now we'd like to ask Mr. Shigemitsu Tsumura, Mayor of Miyazaki City, to speak.

Mr. Shigemitsu Tsumura, Mayor of Miyazaki

My name is Shigemitsu Tsumura, Mayor of Miyazaki City. Miyazaki City is blessed with a beautiful natural environment and a mild climate. People living here are said to be warm-hearted and the city has many historical properties. We were declared "The Japanese Hometown of Culture and Tourism City" in 1965. Miyazaki City has an area

of about 286km² and its population is about 295,000 which is about 25% of Miyazaki Prefecture. And our city is developing as a center of administration, economics and culture in Southern Kyushu. The city is promoting various projects, such as, setting up a well organized traffic network and city zoning. And it is expected to be designated as an international city. Most of all, "The Resort Plan on Miyazaki-Nichinan Coast" which received approval for the first time in Japan, and the government and the people have been making progress. Then, today's topic is "Environment and hygienics of the City." I would like to tell you my opinion and about some of our projects. Nowadays, we can see some discussions on environmental issues in many places, and the people who are conscious about these issues are increasing every year. I am sure that the importance of this problem has been fully recognized by everyone. On this occasion, I would like to propose "How to preserve nature and the environment in Miyazaki" as one of my basic policies and I insist on the importance of natural environment as precious prosperity. This is based on the idea that "Mentalism is better than materialism" or "The life of citizen should take priority over all other things." It is said that Miyazaki is doing well on environmental issues and is ahead in its richness in culture and amenities of life. In that sense, the policy of environment and hygienics must be developed by the cities, towns, villages. I would like to explain some of the specific measures for environmental issues. The "Oyodo River" flows into the Pacific Ocean from the west of Miyazaki City. It is the second largest river in Kyushu next to Chikugo River in Fukuoka. Miyazaki City is developing with this river as a base of industry, economics and culture.

Currently it provides 95% of our drinking water. Its riverbed is used not only for sports and events but also as a scenic area familiar to all the people. It has an important place in city life. It is a natural symbol of hometown for the citizens. But the degree of pollution in the Oyodo River is at a serious level due to developing industry and economics. Therefore, we established the municipal regulation for cleaning it up from April in 1984. It is a step ahead of many other cities in Japan. We also proposed a "Campaign for cleaning up the Oyodo River" which is one of the citizen's 3 campaigns. It is developing in many ways by the citizens, therefore our enthusiasm and activities were expanding to many areas besides Miyazaki City (13 municipalities in Miyazaki and 2 towns in Kagoshima). In this way, last July, the first conference for the Oyodo River was held by the heads of 16 municipalities. In this conference, we declared that "we should make a unified ordinance to make the Oyodo River clean," and we were able to establish it this July by 14 municipalities in Miyazaki. I am sure that this will be more substantial as an environmental preservation for Oyodo River. We put the study of Oyodo River into the curriculum of elementary schools in order to raise the spirit of cleaning it up. And we made textbooks and videotape to help the study

of the Oyodo River so that children would love and clean it.

We are now constructing a "Museum of the Oyodo River" in order to study the cultural and historical aspects of it. This has a "micro-aquarium" which enables us to observe the conditions of insects living in water by special camera, and 15m of water tank and some model equipment which explain the industry and culture around it. Besides this, every year, we choose 6 areas as the model area, where they use soap powder and special kitchen pouch to develop the sense of cleaning it up. And we appoint 40 members who cooperate in making this clean-up project. We will try to make this project more successful and effective in the future. We promote the public sewer system establishment related to the river cleaning movement. Ten years ago, in 1984, the sewer system served 20% of our city, under the national average of 34%. In 1993, it increased to 55%, over the national average of 49%. We would like to try to improve coverage even more, in the future. We have another unique project related to the environment. That is Ushiroda River Greenbelt Furusato Stream Construction Project. This is a management project for the Ushiroda River, a middle size river in the center of Miyazaki, to construct a pure stream in the city and to make it a more prosaic river. We pumped treated water into the sewer system to make the river clean. This experiment was evaluated as the most successful project that year. The Ministry of Construction awarded us the City Landscape Prize last year, encouraging our environmental efforts.

The biggest environmental problem can be solved by the citizens who try to work for it. It is said that cooperation from citizens is very important in reducing the garbage and recycling things. We would like citizens to recognize the importance of environmental conservation. At this point, we established "Garbage Reduction Section" in the "Environmental Business Division," and started the plan of reducing garbage. Most of all, we emphasize the separating and collecting of garbage which can be re-used. We have been trying to get the citizens' cooperation and we have already built the recycle center with private enterprise in the unburnables burying place. Thus, we are developing a system of collecting garbage which can be recycled. We developed many projects such as building the melting facilities for styrol foam, holding flea markets which 23,000 citizens participated in. We hold lectures for neighborhood residence community, women's associations, and groups of senior citizens. We have over 300 lectures each year. City officers go there every time to have night meetings and day time meetings and explain about how to reduce garbage and improve recycling. Sometimes they have 10 lectures in a day. The enthusiasm of city officers in enlightening citizens to this cause lead to cooperation. By these programs, we surely realized the reduction of garbage. The sum number of the burnables and the unburnables estimated about 164,000 tons in 1990 at the peak. In 1993, the sum total became 121,000 tons, 25% of reduction in three years. We would like to promote the reduction of garbage and

recycling with the cooperation of city officers, citizens and enterprises.

From the view of making good conditions as The International Tourist Resort, we would like to promote many projects such as "The Flower City Project" as I have explained elsewhere.

I would like to realize three fundamental support, in my administrative policy, "Abundant city Miyazaki," "Sociable city with sports and environment," "The city consists of citizens who are kind to others." Thank you very much. (Applause)

Chairman Nishimura

Thank you very much, Mr. Tsumura. He introduced the region's environmental philosophy and concrete projects for cleaning rivers, the arrangement of the public sewage system, and waste reduction. I was interested especially in the Oyodo River Summit. All of the scheduled presentations have now been completed. Professor Hanashima, would you like to make any comments?

【COMMENTATOR】

Prof. Masataka Hanashima, Fukuoka University

First of all, I'd like to express my sincere appreciation for giving me this valuable opportunity to participate in the summit as commentator. Global environmental problems, including global warming, have been major topics recently. Today we discussed the city environment and public health, both of which are closely related to our daily lives. I am involved in researching technology for drinking water, sewerage, waste materials and environmental sanitation at the university. It was from 1945 to 1965 that complete systems for drinking water began to be used in Japan. The national government placed a priority on this issue. During the period from 1965 to 1985 sewage treatment facilities were actively constructed. The national average sewerage ratio is over 50 % at present. In large cities such as Tokyo, Osaka and Fukuoka, the ratio exceeds 90 %. The waste issue became a major topic in Japan in around 1985. We have tried to create a clean, healthy and comfortable environment through solutions to these large issues. In spite of the effort, however, Fukuoka City is now suffering from a water shortage. Hearing the presentations from eight cities, I note that there are several common problems as well as those peculiar to each city. I'd like to talk about the Asian countries first. In the Asian countries, many people have moved into the large cities along with the rapid development of the country, and many cities have been overpopulated with those who stay illegally. As a result, a variety of environmental problems have become more serious. As mentioned before, the unsanitary environment surrounding the illegal residents caused infectious diseases in Hong Kong. The government executed a variety of counter-measures including the construction of public toilets and baths, and collecting raw sewage and trash. At the same time they conducted a public housing project on the

largest scale in the world, all with great success. Among the problems, I was especially interested in the issue of the public toilet. Until around 1990, public toilets had been thought of as "dark," "bad-smelling," "dirty," and "scary" in Japan. However, the toilets which Hong Kong constructed in 1992 are very admirable, as shown in the photographs. This was a successful result of city redevelopment projects, including competitions for public toilets. In Japan, the Japan Toilet Association was established in 1985 to improve the image of public toilets. A well-known Japanese architect said that cities with sanitary public toilets give relief for travelers, and also make him consider living in cities. I heard that Hong Kong has a plan to hold an international symposium for toilets in 1995. It seems very unique. I hope to participate in it if possible. Next I'd like to talk about Malaysia. Both the national government and state government set solid waste management as a critical matter to be resolved. As mentioned before, Ipoh, the most beautiful city in Malaysia, is also suffering from increasing waste materials generated from changes of lifestyle and production activities due to the growing economy. The point which I am personally interested in is waste collection. When I visited Malaysia, I saw workmen collecting trash on the streets every 200m. They kept the streets very beautiful and I was quite impressed. Currently the labor force is insufficient, and people don't want to perform such work. This is also true in Japan. The waste collection business is about to fade out. This regrettable state can be improved by future effort. As for the treatment of collected waste materials, they are constructing 2 incinerators with a capability of 300 tons for intermediate treatment. This is a large scale, even for Japan. Japan has made efforts to improve waste problems, especially incinerator-related ones, since around 1955, and has established state-of-the-art technology at last. I think we can help Malaysia through technological exchange. Finally I'd like to mention about final treatment. I heard that a large amount of soil is used to cover buried materials. The amount is four to six times larger than that used in Japan. To settle the problem of the shortage of burial sites, I think that perhaps the fastest way is to reduce the amount of covering soil. Next for Jakarta, the capital city of Indonesia. They face trouble from overpopulation due to the rapid growth of the economy. I was interested especially in the matters concerning scavengers. They number about two to four million, and admirably enough they collect waste materials worth about JY 10 billion in a year. In addition, Jakarta positively offers a variety of training activities and instructions to protect them, and this system is steadily generating chances for employment. It is worth appreciating. As for waste treatment at hospitals and hotels, however, I cannot thoroughly agree with on-site incineration when considering the influence on the surrounding environment. Next I'd like to speak about Manila in the Philippines. It is a superb city and I personally have enjoyed the beauty of the night view. They seem to place importance on beautification of the city, and through measures such

as improvement of canals, flood prevention, and rain water treatment, they preserve the environment with facilities which cannot be found in Japan. Another thing they place importance on is Smoky Mountain, a world-famous complex for final treatment of waste. I visited there about 10 years ago. The surrounding environment was certainly inferior, but the residents looked very neat, even elementary school students. I was quite impressed. About 20,000 people live in Smoky Mountain, and the government positively supports them. Just as in the case of Indonesia, they were organized under a system and making livings as scavengers. I'm very glad to hear that they are engaged in new jobs constructing low-cost housing recently.

In addition, it is also impressive that the local citizenry, including youth, participated in the improvement projects for Smoky Mountain and cultivated an awareness of the related problems. Now I'd like to talk about Japan. Since the great expansion of internal demand in 1985, waste has continued to increase, and it is the most serious problem at present. However, it is becoming more difficult to construct treatment facilities because of opposition by the residents. This is generally called the NIMBY (not in my back yard) syndrome, in other words, the tendency to refuse construction of such facilities in their local region. I suppose you are also suffering from problems similar to this, and I'd appreciate it if you mention them later. Because of this tendency, it is very difficult at present to obtain sites for final treatment plants. Under these conditions, waste reduction is the most important and urgent issue for us. As Chairman Nishimura mentioned before, Saga City sets 6 categories for waste materials to recycle them effectively and completely. In general cities, there are only 3 groups, or 4 at most. He also mentioned that they will try to promote waste reduction through the introduction of a toll system for waste collection, which is currently a much-debated issue in Japan. Next I'd like to talk about the sponsor city, Fukuoka. Fukuoka is a commercial city with a great number of office buildings. The government has established a remarkable system where each building manager actively tries to reduce the waste generated by the offices in their buildings. They also designate "Karl Mark" shops which promote waste reduction in local communities. Moreover, as mentioned before, waste materials are collected during the nighttime in Fukuoka. This is unique in Japan. If you walk around the city in daytime, you cannot see trash or garbage on the streets. I suppose this system must require considerable effort on the part of the people and the government, but it works successfully. They are also examining a new plan for intermediate treatment, that is, power generation from waste. In Fukuoka at present, approximately 2,000 tons of waste are incinerated every day at three large-scale incineration plants. They generate power from the extra heat of incineration. Extra power is sold to the power utility, with sales reaching JY300 million. Power generation from waste will be introduced widely in the world in the future. At present, power of about 150 million kw is generated

in Japan. Power generation from waste is approximately 600,000kw, making up 0.4 % of the total amount. We are working now to increase the percentage to 1.0%. A incinerator with a capacity of 1,800 tons, now under construction in Tokyo, will offer power generation of 50,000kw.

As for industrial waste, as mentioned before, the party creating the waste basically has responsibility for treatment or disposal. However, the issue of waste materials has been more complicated, and it is impossible to obtain sites for final treatment plants without positive support from the government. At the same time, Fukuoka is trying to re-utilize waste materials through a range of plans. Next I'll talk about Kumamoto itself. First, uniquely enough, all of the drinking water is underground water. It is quite tasty, and the citizens of Kumamoto often carry water as a gift when visiting other cities such as Fukuoka. Naturally the most important issue for them is improvement of the sewerage system, to protect underground water from pollution. At present, the sewerage diffusion ratio is only 66%. To increase this number to 100%, they are installing approximately 3,000 small-scale water-purifying tanks in places where it is difficult to install the public sewerage. This idea will be expanded throughout Japan in the future. As for waste, the introduction of transparent bags was successful, providing a 7.2% reduction in total volume and also about a 50% increase in recycled waste. Finally, I'd like to deal with Miyazaki. Miyazaki is a tropical city with rich natural resources. They think of the rivers running through the town as the symbol of the city, and have set river purification as their main theme. To foster a love for rivers among the residents, they place importance on environmental education from childhood. In this respect, the sewerage system has been improved and the diffusion ratio is 55% at present. They are also providing extensive education on waste separation. For example, lectures are held no less than 300 times a year. As the result, they have had great success in reducing waste, cutting volume about 20% in three years. Each city is implementing unique measures for its problems. They can all be good guides for other cities. That is the end of my comments. Thank you.

Chairman Nishimura

Thank you very much.

We have had valuable presentations from eight cities on the theme "City and Environment/Public Health," including the current states and issues related to the environmental problems of waste and sewage. In addition, we have also heard valuable opinions from Professor Hanashima as commentator. Thank you.

Now, I'd like to summarize the contents of the eight presentations. First of all, Saga City introduced measures for waste problems, including the collection system with 6 waste categories, and future plans. Fukuoka City introduced waste treatment facilities, the

history of improvement of burial sites and waste-related problems. Hong Kong showed us concrete projects for street stalls, public cleaning, trash collection and public toilets. Ipoh City covered the current state of solid waste management and the problems they are facing. From Jakarta's presentation, we learned of the re-utilization of solid waste and the roles of trash collectors. Kumamoto discussed the current state and future issues of public sewerage, waste treatment and raw sewage treatment. Manila introduced city development, placing importance on the improvement of the current state of public health.

The presentation of Miyazaki included their ideal environment and concrete plans for river purification, public sewerage and waste reduction. This is a rough summary of each presentation. In general, the presentations included the opinion that it is necessary for us to think of effective methods for waste collection, waste reduction and recycling while improving treatment technology. Proposed measures included unique ideas, such as separation into 6 categories, night-time collection, education for the citizens, introduction of a toll system and improvement of treatment facilities. The presentations also covered the issues of raw sewage treatment, sewage treatment, drinking water, river purification and improvement of the city environment. We also heard enthusiasm or positive evaluation for the Summit, requests for technical support from the industrialized nations for a healthier environment, and wishes that the presentations will serve as guides for other cities.

I think the presentations helped you to understand each other, and you showed very positive attitudes toward exchange and cooperation among cities. The time from now on is scheduled for opinion exchange. Make the most of this time for deeper understanding and mutual cooperation to improve problems of the environment and public health. If you would like to speak, please raise your hand, and let us know your name and your city name before speaking.

Professor Hanashima, do you have a question?

OPEN DISCUSSION

Prof. Masataka Hanashima, Fukuoka University

Even if we try to re-utilize waste as much as possible, there will always be some articles which cannot be recycled by any means. In Japan, however, it becomes very difficult to obtain sites for the final treatment of waste articles because of opposition by the citizens. I would greatly appreciate if the other Asian cities could introduce ideas for the resolution of this issue. The order might be best as Hong Kong, Jakarta, Ipoh and then Malaysia. Could you please present your ideas?