

Any other comments or questions? If not, we would like to close the morning session. We will present a video film before the afternoon session begins. I hope many of you will watch the video presentation.

..... *LUNCH* .....

## Presentation

Regional Planning Board, DKI Jakarta

Now we would like to move into the afternoon session. From  
DKI Jakarta we are going to have a presentation. Please.



How do you do? My name is Aurora Tambunan. I am from Jakarta, Indonesia. Nice to see you all. I am here with my friend, Mr. Rusman Sagala. I come from the Regional Planning Board of DKI Jakarta. My friend Mr. Sagala comes from the Cleansing Department of DKI Jakarta. We will both answer questions afterwards. We come from the government of DKI Jakarta, the Planning Agency, Cleanliness Handling Service in DKI Jakarta, the Solid Waste Management Department.

I will begin the presentation with the existing conditions of solid waste management in DKI Jakarta. Based on the statistics, the number of city residents in DKI Jakarta in 1996 was 9.3 million. There is a study by consultants that in the fiscal year 1996 solid waste production was 2.95 liters per day per capita. So a population of 9.3 million produced around 27,000 cubic liters per day. Up until now, the quantity of solid waste handled by the planning department has been around 88% only. The rest of the solid waste is used for fertilizer, composting, and yard filling in the community. I have here the figure of solid waste production in Jakarta. Of the total production in 1990 to 1993, around 83% could be removed or disposed. In fiscal 1996 we have already passed 88%. So disposal has slightly increased but the production of waste, the generation of waste from the population is still going up. Here is the solid waste composition percentage. In 1990 to 1993 the organic composition was 73.9% and now in fiscal 1996 the ratio has reduced to 65% because of the increase in the amount of inorganic matters.

Now I want to show you the system of solid waste management. From the residential area we have around 58% of the total. Waste from the housing area is being picked up by garbage cart. That garbage, the solid waste from the housing, is collected by the community itself. So the 58% is not collected by the planning department. It is collected by the community and brought to the transfer station and the depot. From the depot the Cleansing Department then takes all the garbage into the final disposal site. So, for the residential area, some 58% is being collected by the community, and from the transfer depot by the Cleansing Department.

There are also traditional markets where some 2.5% is being collected by the Cleansing Department to the transfer. Also the waste from market and commercial buildings is collected by the Cleansing Department to the transfer depot and then it goes to the final disposal site. Industrial waste goes through the waste industrial treatment at PPLI in southern Jakarta. The road park and the river waste, only 2%, goes to the transfer station first and then to the final site. This is a diagram of the participation and responsibility of agencies and city residents and also the private sector in solid waste management. As I said earlier, the city residents participate in collecting solid waste from the households, from the residential area, while the Cleansing Agency and the private sector deal with the management of the other solid waste.

The solid waste transportation service is a direct service. What we mean by direct service is that solid waste is transported from each door by the Cleansing Agency truck. The Cleansing Agency takes the solid waste from each door to the final disposal site at Bantar Gebang. This is done especially in the commercial area. Earlier I explained the indirect service; from the residential area waste is collected by garbage cart, provided by the community itself, to the temporary collection. From there the Cleansing Department does the work and the waste goes on to final disposal.

In Jakarta solid waste management is mainly done by the Cleansing Department. But there are some other departments or agencies that also deal with solid waste, for instance, the Public Works. The waste that is generated in the rivers — we still have rivers that are full with garbage — is picked up by the Public Works Agency. The garbage that is in the parks is picked up by the Gardening Agencies. And also in the market enterprise, they have their own army of trucks that collect garbage and then bring it to the final disposal site in Bekasi.

Bekasi is a city in West Java, which is located to the east of Jakarta. Our final disposal site is located in Bantar Gebang in Bekasi. The final disposal site in Bekasi receives garbage not only from Jakarta but also from Bekasi, itself. One major problem in Jakarta is that we do not have enough available land to build our own

sanitary landfill within the boundaries of Jakarta. So we have to buy land outside the city, in this case in Bekasi. This is a map of Jakarta. You can see the sea, the boundaries of Jakarta and the Bekasi Sanitary Landfill. It is owned by the local government of Jakarta, but it is located outside the boundaries. So we have a special coordination with the local government of West Java. We own the land but they can also put their garbage in our sanitary landfill free of charge. In the system, we also use a transfer station. As I said earlier, garbage is collected by either Dinas Kebershien or the community. It is brought into the temporary site or the transfer station. The transfer station is a place where you compact the garbage so the volume will be reduced. It will then reduce the rate of trucks going into the final disposal site.

There will be a new final disposal site constructed soon. We are in the process of buying 100 hectores of land in the eastern part of Jakarta. Bantar Gebang was constructed in 1990 and the lifetime is fifteen years. From 1990 until now we have had only one sanitary landfill. We are planning to build this new 100 hector site, but we are still in the process of obtaining the land. The construction will begin maybe next year.

For the treatment of waste, besides final disposal, we use some other methods, too. They are recycling and composting, incineration — the incinerator is a small one — and vermi-composting. In the future we would also like to have composting on a big scale or incinerators to big scale. But up until now we have had only a small incinerator.

The Professor from Fukuoka University asked just before lunch about the composting ideas in our countries. In Jakarta, we eagerly try to encourage use of the composting method to dispose of garbage, so as to decrease the volume of garbage going into the final disposal sites. If we can dispose of garbage at the source then we can reduce transport to the final disposal. Solid waste is brought to the recycling plant. And then it will be sorted to organic waste and inorganic waste. The organic waste will become compost and the inorganic waste we recycle, and the residue we bring to the disposal site. We have many scavengers in Jakarta that usually take away inorganic waste and that also is recycling. The composting process itself consists of heaping, rolling up, pouring and harvesting. Usually harvest is within fourteen to forty-five days, when the temperature is stabilized. Then it will be ready as compost. And then sealing and packing. The compost will be used for plants and fisheries. We have a good coordination between our plants and agencies. We force them, or we ask them, to buy the compost. We build the composting site, the building, and let the people of the community do the work. The composting is done by the people themselves so as to give them a sense of belonging in the composting as

near as possible to the source. Then they can benefit more from the work. So we build the building, the site, and leave it to them to operate. It is up to them, to the community, to develop the composting site.

We are trying to make a small incinerator. It is different from your kind of incinerator. It is only 150 to 170 kilograms per hour. We are doing a pilot project now for five cubic meters per day in eight hour operation. This will be for general waste. It is still a pilot project. We are thinking that since a big incinerator needs a lot of money, then we will try a pilot project for very small scale. This is under the supervision of the Environmental Bureau in our city. Another pilot project is vermi-composting. We have tried to use the vermi worm to decompose the waste. The time process is one month.

There are many constraints to solid waste management in Jakarta. One is collection. We feel the waste collection facilities are not yet enough in Jakarta. So we plan, through the local budget, to improve the facilities. Also, there are many temporary traditional markets. A traditional market is a market that is not legal, actually. I mean the site is not legal. So they are there in the morning but they are gone in the evening or the afternoon. They do not have the sense of belonging to the cleanliness of the site. So they go there, they sell, but they just leave the waste. That is one thing that we have to deal with. Our effort is focused on more control and relocating the illegal markets. Another thing is that temporary collection sites are still not enough. Also, we find a deficiency in community awareness. We need more campaigns to the community about the three Rs — recycle, reuse, and reduce the waste. Until now, we have had only one disposal site. But the minimum necessary is two. We plan to have three within the next twenty years. But the problem is that getting 100 hectares of land is very difficult. We are now trying to invite the private sector to come to Jakarta to join together and make an incinerator. There are so many private concerns that have already come to Jakarta. Most come from Japan but so far we haven't yet gotten to an equal basis. Our disposal site capacity will last until 2005. We are negotiating for incineration and reclamation. And another problem is transportation. Also the distance, the disposal site in Bantar Gebang, Bekasi is too far away from the city. It is around forty kilometers, so you can imagine how difficult it is to manage the solid waste with the disposal site very far from us. The last challenges I will mention are: the mechanization of collection facilities, the need to increase sorting efforts at source such as using different plastic bags, the mechanism of truck vehicles such as compactor, hopper, and tipper, the need to accelerate activity at the landfill site by increasing the stock of heavy equipment, the use of methane gas, and the need to increase numbers of field workers by using daily workers.

Okay, I think that is all for the presentation from DKI Jakarta.

## **Discussion** ||||||||||||||||||

### **Chairman**

Thank you very much, Ms. Aurora Tambunan. Ms. Tambunan talked about how waste is collected and disposed in Jakarta City. She talked about the system for composting as well as plans and methods for recycling, vermi-composting and a new type of incinerator. Thank you very much for your presentation. You mentioned many of the constraints you still face and we all know that when it comes to waste disposal it takes time to get concluding results. Any questions to the speaker?

### **Prof. Yasushi Matsufuji (FUKUOKA UNIVERSITY)**

Thank you very much for your talk. In your presentation you talked about composting. And you introduced a very interesting type of composting using worms, vermi-composting. Could you please give us a more specific description of vermi-composting?

### **Ms. Aurora Tambunan (JAKARTA)**

Unfortunately, I do not know the details of vermi-composting. I believe the idea is from Manila. The private sector is attempting composting by vermi worm. In 14 days, if I am not mistaken, it can decompose into compost. I am sorry I do not know details but it is a pilot project in Jakarta now.

### **Mr. Deogracias Manimbo (MANILA)**

Actually we are not yet doing this in Manila. However, there are studies regarding the use of worms. Rather than Manila, I believe the concept is done in other cities. Sorry, we don't have the details of that vermi-composting. Thank you.

### **Mr. Toshio Kinoshita (JICA)**

In the City of Jakarta you have various systems. I am not an expert in waste management, but I would like to introduce a different perspective and I will have one or two questions at the end. Today Ms. Tambunan talked about city waste. JICA has a focus on managing city or urban environments. In our projects, JICA is active in cooperating with other countries in the field of urban environment. In 1990, we started a cooperation with various partners. At the beginning of the 1990s, the total budget of JICA dedicated to environmental cooperation was 10%, but the percentage has now increased to 16-17%. So, we are placing more emphasis

on environmental cooperation. When we discuss urban environments, there are technological perspectives and financial perspectives. How can we finance environmental projects in the cities? In terms of finance, OECF, which is different from JICA, is active in environmental cooperation. They have a special low interest rate loan for environmental projects. Aurora Tambunan stated the importance of the private sector. How can we incorporate the private sector in the field of development? This is very important globally. The ODA budget is shrinking world-wide. As you know, there is some financial restructuring in Japan and since last year we have been shrinking the budget for ODA. However, the environmental ODA is expanding and being supported, which is a good sign for the global environment. This June there were special sessions of the Diet where Prime Minister Hashimoto introduced the Green Initiative and another initiative on the promotion of environmental cooperation. So the total ODA budget is getting smaller while the ODA budget for environmental cooperation will be expanded. This is a special area of interest. This is the first comment. The second comment is that JICA tries to cooperate with local governments. Today we have representatives from Kitakyushu City and from Dalian. Between Dalian and Kitakyushu City there are cooperative projects. We try to support these using the ODA budget. And we are at work to improve the environmental model area in Dalian. We have cooperation, not only on a national basis, but also on a local basis. Dalian and Kitakyushu have a special cooperation.

I have two questions. In the City of Jakarta it is very important to utilize the private sector. Do you have any specific projects or do you have any ideas about what you want us to do to support or assist in the activation of the private sector? Also, you talked about the difficulty in selecting sites for landfilling. In order to get a consensus of the local residents or citizens, environmental impact assessments seem to be very important. In the City of Jakarta what is the process of getting EIA, environmental impact assessments? How do you get the consensus of the local citizens? These are the two questions I want to raise.

**Ms. Aurora Tambunan (JAKARTA)**

Thank you. First of all I have to admit that our master plan for solid waste management, which is being done for the first time, is under financing from JICA. This was arranged in 1990, if I am not mistaken, through the Directorate General of Cipta Karya in the central government. So it is a grant from the central government to us the local government. Based on the master plan, the system is to have a temporary site and transfer stations and the sanitary landfill. There was no mention of incinerators at the time of the 1990 master plan. In 1994, JICA also made a study for central Jakarta. Based on that study we arranged a loan through OECF

to build a transfer station in the Sunter area. The master plan for the transfer area in Sunter is already finished. Construction will begin next year. So there is great cooperation with JICA and OECF.

Regarding the private sector in solid waste management in Jakarta, one strategy involves our plan to build transfer stations in the western part of Jakarta. These transfer stations are being constructed by the private sector on the city's land. That is the joint coordination between us and the private sector. The project itself is PPP — public private participation. In fact, it is a local investor building the transfer station. There are a lot of investors interested in Jakarta, as I said earlier. They offer to build transfer stations and incinerators. These projects cost about 200 billion rupiahs, which is too much for the city to bear. We are not yet capable of building an incinerator at that cost. So we asked the private sector to come, not to sell the incinerator, but to work together with us. Perhaps the land would be from us, and then maybe the electricity that is produced could be managed by the private sector, and so forth. There are now two or three investors who are negotiating with us regarding incinerators. We also have waterfront development in Jakarta. One of the investors there is planning a proposal for land reclamation with a sanitary landfill, just like in Tokyo Bay. The investor has some experience in land reclamation through solid waste.

About the EIA — our problems with finding a site are not solely due to the rejection of the people. Within the boundaries of Jakarta, we do not have enough land. The city is so full of people that to find 100 hectares for a sanitary landfill is very difficult. That's why we have to go outside our boundaries. If the land is of the neighboring local government you can imagine how they might reject our proposals: "This is not our waste, this is Jakarta's waste. Why should you put your waste in our area?" The pro and contra goes something like that. That is why we allow them to dispose their garbage in our landfill, as compensation for use of their land, although we do purchase the land.

From the EPA, there is a national EIA and a local EIA. For this kind of matter it is under the national EIA and there is a certain procedure to follow. We have a national commission and the local commission. So for instance in the new sanitary landfill that is to be built, we need permission from the local government, whether the site chosen is suited for a sanitary landfill according to their master plan. After that we need permission from the environmental impact commission of that area. After that we go on to the environmental impact assessment at the national level. That is the procedure. Thank you.

**Mr. Ian Maxwell (AUCKLAND)**

I'm very impressed with the work that the local communities are doing to help clean up the areas in which they live. I only wish our own communities would take such efforts instead of relying on government agencies. How does the Cleansing Department go about encouraging this activity? Do you run, for example, competitions? Or do you have education programs? Or do the people just see their interest in it and, in fact, do it on their own?

**Ms. Aurora Tambunan (JAKARTA)**

Competition is a key word. We have a competition at the national level. Jakarta consists of five cities. Although Jakarta itself is the metropolis, we have five mayors in Jakarta. The competition is between the five cities in Jakarta. One of the points of competition is public participation in dealing with solid waste. Now, in that competition, the head of the districts encourage their people. "If we get that trophy, our city will be..." and so forth and so on. Fortunately, each mayor has already won one competition and the trophies are on display in the central parks. There, it says that this is the product of the people, so they have a sense of belonging and know that what they are doing is being looked at on the national level.

We have to admit that it is a very difficult job to encourage people. That is why we also use a kind of subsidy. If I may explain: the buildings for the composting and so forth are given by the local government, we build them for the community. We even provide three months payment for the local people before the compost is ready to be sold. That is how we encourage them to do the composting. After the three months, we expect them to go on with their production and if they sell the compost the profit will come to them. But it is not as easy as that. Some composting plants go on, but some do not. The attitude may be: "I have to work only three months and after that give me some more." For a few of the composting plants we do add some more. It's not an easy task actually. We also have a task group to take out the compost produced and market it. We do not let local communities slash to try to find the market, rather we supply them with the market. One problem, so far, is the market complaint that the standard of compost is not the same. We are now trying to teach them, to supervise them, to bring the standard of compost to the same level. Thank you.

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

I would like to make a general comment and ask questions to Ms. Aurora Tambunan. This is further to the question Mr. Kinoshita raised. What does the government need, what do you want us to help with, in utilizing the private sector? It seems



the construction and operation of incineration plants will begin and in that process BOT and project financing is required. At our department we had a workshop in Bangkok in June this year and at that time there was a discussion which I would like to summarize briefly. They want to use the private sector to build an infrastructure. However, private investors and the government have different perspectives. There is a discrepancy. The government wants to have as much investment as possible because the government lacks money. They need money to build incineration plants, highways, power plants. On the other hand, the private sector understands the intent of the government but has its own logic. Without having some assurance of profit from the government, they may not be able to make an investment. So there are conflicts of interest between the private sector and the government. Sometimes the terminology they use is different. The term of construction works might be different. So they may not use the same language in discussing the collaborations between the private and public sector. It is necessary to have experts involved, not only at the policy level, but also at the working level. Otherwise, there will not be good communication between public and private. The United Nations, the World Bank, or JICA, may play a role as a go-between for the public and private sectors. This is what we have experienced. But I am not sure whether you have seen that conflict of interest in the case of Jakarta, in using private sector investments in constructing incineration plants. Do you feel it necessary to have the participation of JICA, for example? What is your comment, Ms. Tambunan?

**Ms. Aurora Tambunan (JAKARTA)**

Yes, everybody agrees that there is conflict between the government and the private sector. But that does not mean that the conflicts can not be reduced to the lowest level. In Jakarta, we do not yet have an incinerator. Up until now, what the investors have offered seems like the private sector you mentioned. They think about the amount of money they can gain by selling the incinerator. Perhaps that is why the negotiation has not yet reached a final position, because of the conflicting ideas. I agree that we have to sit together more to get a balanced win/win situation. We do not ask the private sector to be a servant for the country. They have their own aims in what they are doing. They have to make a profit, while we, the government, have to think of the service for the country. But what is your suggestion? If I may ask, what is the condition here in Japan or Fukuoka? What is the experience of Fukuoka? Are there any private sector concerns that are doing incineration or solid waste management, for instance, a sanitary landfill? Are these done wholly by the government? Also is there any plan or position where the private sector can participate? I think that is one question that we from the developing countries

would ask you who have more experience. Is all construction done with the government's money or another way?

**Mr. Teruo Hongo (FUKUOKA)**

In construction of incineration plants we don't have any private money used. We have subsidies from the national government and also the city government will borrow money. We also use our municipal budget to construct incineration plants. In terms of the private sector's involvement, collection is done by the private sector, although it is controlled by the city government. This is a kind of consignment. Also the operation of the incineration plants is consigned to the private sector. The same is true for the operation of landfilling and sewage plant operations. They are constructed by the government and run by the private sector. However, operation is supervised by the city government's experts. This is how we work.

**Mr. Tetsuro Tsuruoka (FUKUOKA)**

In the case of Japan there is a law regarding waste management. Garbage and waste related business is to be under the responsibility of local governments. The national government subsidizes the local governments so that sanitary waste management can be achieved. However, recently the facilities are built by the city or local government, while the operation is done partly by the private sector. In the case of Fukuoka City, most of the operation of waste management facilities is consigned to the private sector. The responsibility still lies with the municipal government but the actual, daily, routine operation is done by the private sector. This is for general waste like night soils and household garbage. What about industrial waste? Industrial waste is under the responsibility of the companies producing the waste. So corporations are responsible for disposing and treating the waste produced by them. For general household garbage we have control on the part of the local governments. Currently we are discussing further privatization of the processing and management of household waste.

**Mr. Toshio Kinoshita (JICA)**

I have an additional comment. Jakarta City is a megalopolis. You said the population is 9.3 million. The urbanization is very rapid. From the basic research conducted by JICA, it seems Asian regions will have more urban concentration of people to megalopolis. Then the urban environment will be beyond the management of the government. How can we control the population in the cities or megalopolis to be considered? We need to have a healthy growth of cities. We are just now having discussions here in Kyushu. In Kyushu, we must vitalize cities throughout

Kyushu Island so that we can avoid a concentration of population to certain megalopolis outside of Kyushu. The ultimate means lie in controlling the size of megalopolis. We need to have more decentralized cities throughout the nation so that cities can be more manageable.

## **Presentation** |||||

**Mr. Roger Matthews**

**Manager of Public Development, Auckland**

### **Chairman**

Thank you very much, Ms. Aurora Tambunan for your presentation. We would like to call upon the representative from the City of Auckland for the next presentation.



### **Mr. Roger Matthews (AUCKLAND)**

Auckland City is the largest urban authority in the Auckland region and has a population of 350,000 people out of a greater metropolitan population of one million people. The urban area of Auckland City is now fully developed and therefore there is no space within the administrative boundary for refuse landfills, although this has not always been the case. Disposal of the city's solid waste is now achieved by a transfer to a number of landfills around the fringes of the urban area. The main landfill issue for the city does not concern the disposal of solid waste, but rather the management of historic landfills, which were operated with various levels of control, monitoring, and legality up until the early 1980s. Local government in New Zealand has been going through a period of intense reform over the last decade and it is a feature of the New Zealand economy, generally, that central and local government service functions are being corporatized or privatized. Because of its geography, Auckland City has not operated landfills since the 1970s, and until the late 1980s solid waste disposal was carried out by the regional branch of government. In 1989, all service delivery functions of the Auckland Regional Council were transferred to the private sector, or to local, regional government owned companies.

At this time the solid waste disposal functions for the region were transferred to a local government owned company called Northern Disposal Ltd. This company operates two landfills, one to the north and one to the south of the city. Since then, two private companies have entered the now competitive market: Waste Management Ltd. and Waste Care Ltd. These companies operate one landfill each. All four of these landfills are operated with multiple liner systems to contain leachate, leachate