

JAPAN INTERNATIONAL COOPERATION AGENCY

MINISTRY OF HOUSING AND LOCAL GOVERNMENT, MALAYSIA

**THE STUDY ON
THE SAFE CLOSURE AND REHABILITATION OF
LANDFILL SITES
IN MALAYSIA**

**FINAL REPORT
Volume 7**

Data Book



NOVEMBER 2004

**YACHIYO ENGINEERING CO., LTD.
EX CORPORATION**

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The Final Report of “The Study on The Safe Closure and Rehabilitation of Landfill Sites in Malaysia” is composed of seven Volumes as shown below:

Volume 1 **Summary**

Volume 2 **Main Report**

Volume 3 **Guideline for Safe Closure and Rehabilitation of MSW Landfill Sites**

Volume 4 **Pilot Projects on Safe Closure and Rehabilitation of Landfill Sites**

Volume 5 **Technical Guideline for Sanitary Landfill, Design and Operation (Revised Draft, 2004)**

Volume 6 **User Manual of LACMIS (Landfill Closure Management Information System)**

Volume 7 **Data Book**

This Report is “**Volume 7 Data Book**”.

Table of Contents

Book 1 : Record of Seminars and Workshops

1. First Seminar on The Study on the Safe closure and Rehabilitation of Landfill Sites in Malaysia 1-2
2. Second Seminar on The Study on the Safe closure and Rehabilitation of Landfill Sites in Malaysia 1-21
3. First Training Workshop on The Study on the Safe closure and Rehabilitation of Landfill Sites in Malaysia 1-44
4. Second Training Workshop on The Study on the Safe closure and Rehabilitation of Landfill Sites in Malaysia 1-54

Book 2 : Lists of Landfill Sites in Malaysia

Book 3 : Survey Inventory Sheets of Landfill Sites

Book 4 : Result of Social Survey on Landfill Sites

- Chapter 1 General View and Recognition 4-1
Chapter 2 Interview Surveys on Closures of Landfill Sites 4-10

Book 5 : Amount of Methane Gas Reduction by Introducing Semi-Aerobic Landfill

- Chapter 1 Introduction 5-1
Chapter 2 Prerequisites 5-2
Chapter 3 Result of Computation 5-15

Data Book 1

Record of Seminars and Workshops

1. First Seminar on The Study on the Safe closure and Rehabilitation of Landfill Sites in Malaysia
2. Second Seminar on The Study on the Safe closure and Rehabilitation of Landfill Sites in Malaysia
3. First Training Workshop on The Study on the Safe closure and Rehabilitation of Landfill Sites in Malaysia
4. Second Training Workshop on The Study on the Safe closure and Rehabilitation of Landfill Sites in Malaysia

First Seminar on The Study on the Safe closure and Rehabilitation of Landfill Sites in Malaysia

Questions & Answers and Panel Discussion Sessions - Minutes

1st Day, September 18th, 2003

Session 1

Chairman

YM Engku Azman Tuan Mat

Speakers

Dr. Yasushi Matsufuji, Professor, Fukuoka University, Japan

En. Abdul Halim Abdul Hamid, MHLG

Mr. Hisashi Yamauchi, JICA Study Team Leader

Question No.1. *En. Amirul Bahri Malek (E-Idaman Sdn. Bhd) to Dr. Matsufuji.*

With reference to Dr. Matsufuji's video presentation on the landfill site in Samoa, the question was whether the rubbish (waste) from the original landfill transferred to the new landfill site. Would Dr. Matsufuji recommend transferring waste from the dumpsite into the new managed landfill, and whether it is economically viable to do so.

Answer No.1

Dr. Matsufuji replied that the Samoa Case Study was to improve the existing landfill and did not move the old waste. The waste can be moved from the old site to the new, but the neighbouring people may complain. The importance is in the improvement of the site.

Question No.2 *En. Amirul Bahri Malek (E-Idaman Sdn. Bhd) to En. Abdul Halim*

The question was whether there are any steps taken by the Government to provide financial incentives for recycling.

Answer No.2

En. Abdul Halim replied that the Government have had discussions in the matter and the treasury have introduced some incentives by reducing the import tax for recycling related equipment. Besides that, the Ministry are coordinating with relevant agencies to discuss on what sorts of incentives that can be given to the recyclers or parties involved in recycling.

Question No.3 *Pn. Nor Yati Bte Ahmad (SUK Melaka) to Dr. Matsufuji*

From previous studies, how long does it take to transform a closed landfill to a site suitable for housing development assuming that the landfill site was well managed and has been closed properly?

Answer No.3

Dr. Matsufuji replied that he does not have the detailed years, but they are dependant on the type of landfill and type of waste. From his opinion, at least 10 years is required.

Question No.4 *Pn. Kamariah Bte Mohd Noor (E-Idaman Sdn Bhd) to Mr. Yamauchi*

With reference to the 4 landfill closure levels, i.e. C1, C2, C3 and C4, why are there only 4 levels, and is there a rationale behind it. What are the rationale behind selecting the level C3 for the Ampang Jajar and Pekan Nenasi Pilot Projects, and level C2 for the Ampang Jaya Pilot Project.

Answer No.4 Mr. Yamauchi replied that the levels were divided into 2 categories, i.e. for operating sites and for closed sites. For the closed landfill sites, due to lack of funds and maintenance, level C2 is basically proposed. As for the operating sites whereby funds may be available for further improvement and monitoring, level C3 is proposed. Further details shall be explained in the Pilot Project Action Plan. The level for each site are determined and evaluated by considering the environmental impacts and to the land utilisation possibility for the site. A rating system has been developed to assess the target closure levels.

Question No.5 *YM Engku Azman Tuan Mat (Chairman of Session 1) to Mr. Yamauchi*
Why was the Ampang Jaya Pilot Project site set at level C2?

Answer No.5 Mr. Yamauchi replied that initially the Ampang Jaya site was set at level C3, whereby the recirculation of the leachate is necessary. However, due to the operations cost and lack of funds, it was decided in discussions with MHLG and MP Kajang not to provide the leachate recirculation system by the Pilot Project. However, Mr. Yamauchi stressed that Ampang Jaya site shall be improved to at least level C3, because the water intake point is located downstream of the site.

En Abdul Halim Abdul Hamid further informed that the Ministry is planning to provide new large centralised landfill site for the future and these sites shall be designed to include consideration for proper closure.

Question No.6 *Dr. Noor Hisham Bin Ramly (ADCE Sdn Bhd) to Dr. Matsufuji*
With regards to the post closure usage of the stabilised landfill, the waste layer use for parks and recreational facilities, medium layer usage for low-rise buildings, and the entire layer usage for high-rise buildings, how is the stabilisation level determined?

Answer No.6 Dr. Matsufuji replied that the sites shall be determined by examining the content of the organic matter, gas content, temperature of the surface layers and the leachate. Monitoring and analysis of the parameters shall be carried to determine the suitability for use.

Question No.7 *Rozita Bte Musid (Alam Flora Sdn Bhd) to Dr. Matsufuji*
With reference to the Dr. Matsufuji's video presentation on the landfill site in Samoa, what was the tonnage capacity of site, and what was the baseline for the leachate data that was collected before and after the implementation of the Fukoaka Method?

Answer No.7 Dr. Matsufuji replied that population of Samoa is only 300,000 and the site in question only receive 200 tonnes of waste per day. The area is about 2 hectares. The leachate quantity is about 7000 – 10,000 ppm BOD. At present, Dr. Matsufuji does not have any data on the leachate quality, however, based on experience, the leachate quality will improve within 1 to 2 years time, and the BOD may decrease to 100 – 200 ppm, similar to those experienced in Ampang Jajar and Pulau Burung Landfill Sites.

Question No.8 *Rozita Bte Musid (Alam Flora Sdn Bhd) to Mr. Yamauchi*
With reference to the landfill sites visited by the Study Team, what are the leachate data that were collected, particularly for leachate quality collected upstream of water intake points?

Answer No.8 Mr. Yamauchi replied that the JICA Study Team members visited a total of 64 landfill sites but no leachate sampling or analysis was carried out. However, for the 3 Pilot Project Sites, the leachate monitoring works are being carried out periodically and after the completion of the projects the data shall be available.

Question No.9 *Rozita Bte Musid (Alam Flora Sdn Bhd) to En. Abdul Halim*
With reference to the leachate quality collected upstream of water intake points, what are the Government measures to rectify the current environmental problems?

Answer No.9 En Abdul Halim replied that MHLG, in the Malaysian Plan had prepared some fund to upgrade certain landfills phase by phase. For the short term measures, MHLG in discussion with relevant agencies and Local Authorities on how to resolve the matters with respect to funding and project implementations. MHLG will also seek assistance from Alam Flora and Southern Waste, and other relevant agencies.

Question No.10 *En Mohd Gasing Bin Saling (MP Tawau) to the Panel*
En. Mohd Gasing suggested that JICA should extend the study on landfills to cover Sabah and Sarawak, or else the West Malaysia States will be left out.

Answer No.10 Dr. Matsufuji replied that the Local Authorities should write to JICA Malaysia office to request for the study.

En. Abdul Halim informed that although the field survey of the study was carried out in the Peninsular of Malaysia, the reports can be used for the safe closure and rehabilitation of landfill sites in Sabah and Sarawak. En. Abdul Halim further suggest that the Local Authorities can request to MHLG and MHLG shall forward such request to JICA.

Question No.11 *En. Noor Mohamed Bin Mohd Hakiba (UPM) to Dr. Matsufuji*

Further to the question related to post closure land usage for high-rise buildings, with the Malaysia's poor records in landfill management, what are the experts advise on having such buildings on such sites?

Answer No.11 Dr. Matsufuji replied that the usage of each site shall be determined based on the type of sites and conditions. It is not possible to judge without proper information.

YM Engku Azman informed that each site has to be determined individually and decision shall be based on examination and monitoring of the characteristics of the site, i.e. the waste layer etc. The easy way is not to allow any construction on all the sites unless more information and data on the particular site is available.

Question No.12 *En Mohd Azdan Bin Ashari (Alam Flora Sdn Bhd) to Mr. Yamauchi*

With reference to the process in defining the closure levels, was any consideration taken with regard to the legislation of Malaysia, in particular with the Environmental Quality Act. For example, no matter what level of closure, the leachate discharge must comply with the Standard A or B.

Answer No.12 Mr. Yamauchi replied that at preset closure procedures, it is difficult to meet the stringent requirements as stipulated in Standard A or B, because of the financial limitations, etc. As for operating and closed landfill, the important issue is to try to upgrade and improve the quality of all the landfills step by step.

YM Engku Azman informed that for the old landfills, EIA was not required, however, for new landfill sites, EIA is required and the impact can be determined in due course.

Session 2

Chairman

En. Mohd Nazeri Bin Salleh, MHLG

Speakers

Mr. Kohshi Takahata, JICA Study Team Member

Question No.1. *Pn. Kamariah Bte Mohd Noor (E-Idaman Sdn Bhd) to Mr. Takahata*

With reference to the Guideline on the Safe closure of Landfill Sites in Malaysia, the section on how to handle the PCM (Post Closure Management) for the 3 types of landfill, i.e. operating, closing and closed, will there be 3 separate guidelines for each of the type of site?

Answer No.1 Mr. Takahata replied that it is not practical to have 3 separate guidelines for each of the 3 types of landfills as majority of the issues shall be duplicated. The guidelines shall be applicable for all categories but with specific reference to the types.

Question No.2 *En Mohd Azdan Bin Ashari (Alam Flora Sdn Bhd) to Mr. Takahata*
How detail will the guidelines be? Will there be detailed guidelines on the design and specifications for thickness of cover, etc?

Answer No.2 Mr. Takahata replied that only certain specifications will be provided in the Guidelines. Since majority of the specifications are related to the type of waste and landfill characteristics, it is impossible to have specific parameters for all type of waste, however, a recommended range of parameters may be provided.

Mr. Hiroshi Abe (JICA Study Team Member) informed that at present there are no guidelines for Malaysia with respect to landfill safe closure issues. The draft guideline as prepared by Dr. Matsufuji earlier is still in the "Draft" stage and not officially authorised. Hence, for the time being, a simple guideline is sufficient if it is to be applied. The most important issue of the guideline is the framework and its application.

Question No.3 *Nor Aziah Bte Jafaar (DOE) to Mr. Takahata*
Who (Which) authority in Japan gives the approval to the PCM Plan?

Answer No.3 Mr. Takahata replied that are 2 systems in Japan and in some industrialised countries, 1 for municipal waste which is managed by the municipal government, the other is the special reserve funds for industrial waste whereby a portion of the tipping fee is reserved for PCM. There are also a special type of public bank whereby the landfill operators may apply for funds for PCM if industrial waste landfill sites.

Session 3

Chairman
Speakers

Mr. Hisashi Yamauchi, JICA Study Team Leader

i. Ms. Margarita T. Caridad, Engineer III, National Solid Waste Management Commission, Office of the Secretariat, Philippines

ii. Mr. Paisan Padungsirikul, Director of Solid Waste and Nightsoil Division, Pollution Control Department, Thailand

iii. Ms. Nguyen Thi Hoang Lan, Head of International Relation Department, URENCO, Hanoi, Vietnam

iv. Dr. Sayamang Nanthanavone, Deputy Director of Urban Cleansing Service, Vientiane Municipality. Laos

v. Moeung Sophan, Head of Public Works Office, Phnom Penh Municipality, Cambodia

Question No.1. *Mr. Hisashi Yamauchi to Mr. Paisan Padungsirikul (Thailand)*
Mr. Yamauchi requested for more details on the Environmental Fund, which is on going in Thailand.

Answer No.1 Mr. Padungsirikul replied that the Environmental Fund is under control of the Office of Environmental Policy and Planning, Ministry of Natural Resource and Environment, which is responsible for policy development and financial support. The ministry can provide 2 type of funding for environmental planning, either as a soft loan or as a subsidy to the Local Authorities. The LA may submit budget proposals to the Board of the Environmental Funds for subsidy. Other related parties such as NGO may also submit their proposals for the fund.

Question No.2. *Mr. M. Raju (MP Seberang Perai) to Ms. Nguyen Thi Hoang Lan, Hanoi, Vietnam(Thailand)*
With regards to the composting plant in Vietnam, how is it operated and what happen to the compost?

Answer No.2 Ms. Nguyen replied that the composting plant in Vietnam was provided by UNDP, from Spain, with a capacity of 50,000 tons of compost per year. The compost is use for agricultural purposes.

Question No.3. *Mr. Hisashi Yamauchi to Ms. Margarita T. Caridad, Philippines*
With regards to JICA Study Team's Action Plan for improvement of landfill sites, about 50 landfills sites in Malaysia are to be improved by the year 2010. As mentioned in the presentation, how are the Philippines authorities planning to improve the hundreds of landfill sites within the next few years?

Answer No.3 Ms. Margarita replied that in the Philippines, a total of 1500 Local Government Units (LGUs) are in charged of collection and waste disposal to the 721 open dumpsites nationwide. Under the current solid waste management policy all the open dumpsites shall be closed or rehabilitated within the next 3 years. Some will be upgraded to controlled dumpsites and new sanitary landfill facilities (SLF) shall also be provided. It is estimated that the cost to provide a SLF is about 13 Million Pesos per hectare, (about RM1.1 Million/ha). It is also estimated about 150 to 200 ha of SLF will be required for the major cities and urbanised region of Philippines.

Question No.4. *Mr. Koh Chee Yong (MHLG) to Mr. Paisan Padungsirikul (Thailand)*
With regards to the incinerator plant at Phuket Province, what type of plant is it and what is the overall operations and maintenance cost?

Answer No.4 Mr. Padungsirikul replied that the incinerator plant is operated by the Phuket Municipality. Currently the quantity exceeds 250 tonnes per day. A 100% privately owned recycling facility have been provided inside the compound of the plant to recycle about 50% of the waste received. The incineration is of Japanese design and provided by the Central Government of Thailand.

The annual O&M cost is about 50 Million Baht (about RM5 Million), and subsidised by the Central Government for the first 4 years. From this year till the next 4 years, the subsidy will be reduced to 75% of the annual cost, the Municipality will have to finance the O&M of the remaining 25%.

Phuket is a tourist area and the waste quantity increases during the holiday seasons. Currently, the Phuket Municipality are discussing with the Central Government to continue with the funding the O&M costs.

The organic portion of the waste account for 50% to 70% of the waste. A composting facility have been proposed in the future. This is also encouraged by the Government of Thailand as to reduce the environmental effects of the incinerator.

The incinerator in Samui on he other hand is under utilised and only operated 2 days a week. The operations cost is high due to the constant starting up procedures.

2nd Day, September 19th, 2003

Session 4

Chairman Ir Fong Tian Yong, Deputy Director General, Local Government Dept, MHLG

Speakers En. Ahmad Husni Hussain, EPU
Mr. Koichi Kubokura, Fukuoka City Environmental Bureau, Japan

Question No.1. *Mr. Sim Chai Hee (MB Kuching Selatan) to the Chairman*

With reference to En. Ahmad Husni's presentation on the Method of Billing, Mr. Sim suggested to the Chairman to organise another session of discussion to address the pros and cons of the entire billing system, as it is a major issue concerning the waste collection contracts.

Answer No.1 This will be discussed later in MHLG.

Question No.2. *En. Roseli Bin Ismail (SS Selenggara Padu) to En. Ahmad Husni*

With reference to En. Ahmad Husni's presentation on the present agreement for the privatisation of solid waste in Malaysia, with regard to the statement on the problems and constraints served as 'Lesson learnt', En. Roseli commented that the 3 concessionaires companies have been operating under an interim agreement for sometime, and lessons have already been learnt. When will be actual privatisation agreement be signed?

Answer No.2 En. Ahmad Husni replied that at present, discussions between the Federal Government, Privatisation Committee of the EPU and the concessionaire are being carried out. However, En. Ahmad Husni is not able to confirm on the actual date but commented that it should be by no later than the end of next year.

Question No.3. *Mr. M. Raju (MP Seberang Perai) to En. Ahmad Husni*

With reference to the Federal Government's large spending in the provision of a transfer station and an incineration plant in Kuala Lumpur, and since the government is promoting recycling, why is there no action taken to provide large scale recycling facilities?

Answer No.3 En. Ahmad Husni replied that the Government is actively promoting recycling efforts and also in educating the public to be more aware of recycling and minimisation of waste. En. Ahmad Husni informed that the department shall take Mr. Raju's suggestion into consideration.

In response to the same question, Y.Bhg Dato' Mohamad Bin Said, Director General, Local Government Department, MHLG, joined in the discussion and informed that at present, the waste situation in Kuala Lumpur is very critical, and there is an urgent need for disposal facilities. The Puchong landfill will be closed in 2004 and the Taman Beringin Landfill has been closed. In the short term, there is not choice for Kuala Lumpur except to adopt the incineration process due to the lack of landfill space. Y.Bhg Dato' Mohamad also commented the present seminar session in to discuss the issues related to landfill closures, perhaps another discussion session is required in the future to discuss the waste management issues.

Question No.4. *En. Noor Mohamed Bin Mohd Hakiba (UPM) to En. Ahmad Husni*

With reference to recycling programme, will the government introduce any deposit system for recycling?

Answer No.4 En. Ahmad Husni replied that the questions should be addressed to MHLG since the ministry is in charge of the recycling programme. En. Ahmad Husni informed that he is not aware of any such deposit scheme.

Session 5

Chairman Ir Fong Tian Yong, Deputy Director General, Local Government Dept, MHLG

Speakers Dr. Mohd Nasir Hassan, Associate Professor, UPM
En. Zainuddin Arshad, AMN, JICA Study Team Member

Question No.1. *En. Zamri Bin Abdul Rahman (Worldwide Landfill Sdn Bhd) to En. Zainuddin Arshad, AMN.*

With reference to the Pilot Project Implementation, especially with relation to the Ampang Jajar site, only a section of the site shall be rehabilitated, and monitoring being carried out. How can the project ensure that the closure is successful if bearing in mind that the groundwater and gasses will be moving in many direction?

Answer No.1 En. Zainuddin replied that the pilot project is only for a section of the site and should be continued by the Local Authorities in the near future.

However, the monitoring wells installed by the pilot project are not just for the project and are meant to be used by the LA in the future. Effects of the pilot project will be continuously monitored.

Question No.2. *Mr. M. Raju (MP Seberang Perai) to En.Zainuddin Arshad, AMN.*

Firstly, Mr. Raju thanked the JICA Study Team for carrying out the Pilot Project at the Ampang Jajar, Seberang Perai site. Further to that, Mr. Raju requested the JICA Study Team to share the information related to the cost of implementing the pilot project works.

Answer No.2 En. Zainuddin informed that the cost of works is dependent on the type of works to be carried out and subject to the conditions of the sites to be closed. Eventually, after the pilot project implementation, an overall cost for landfill closure shall be determined, and this cost shall be in terms of a budgetary figure of RM per hectare.

Question No.3 *En Mohd Azdan Bin Ashari (Alam Flora Sdn Bhd) to Dr. Mohd Nasir Hassan*

With reference to the studies carried out for the landfill sites in Kuala Lumpur, can the studies be further expanded to evaluate the rate of stabilisation of landfills?

Answer No.3 Dr. Mohd Nasir replied that the proposed guidelines have been tabulated in page 14 of his seminar presentation report. For the present type of waste, which is about 60% organic, the sedimentation rate is high. However, if the landfill is to be redeveloped, the sedimentation rate should be monitored to be less than 3cm sedimentation per year before redevelopment is allowed. Further studies are being carried out to pertaining to these issues.

Question No.4. *Dr. Daud Batchelor (MB Technology Sdn Bhd) to En.Zainuddin Arshad, AMN.*

With regards to the Pilot Project gas venting works, is there consideration for flaring the landfill gas, and if not, what is the justification for not flaring, bearing in mind the large amount of methane will be released to the atmosphere.

Answer No.4 Dr. Mohd Nasir replied on behalf of En.Zainuddin stating that the pilot project implementation is more towards the creation of semi-aerobic conditions, and thus the gas production is lesser as compared to gas generated by the anaerobic landfills. The pilot project is more concerned with the closure issues and gas utilisation issue is not a priority.

Question No.5. *Pn. Kamariah Bte Mohd Noor (E-Idaman Sdn Bhd) to En. Zainuddin Arshad, AMN*

With reference to presentation by En. Zainuddin, with regards to the

selection criteria, why were the 3 sites selected bearing in mind that there are other more urgent and suitable sites.

Answer No.5 Dr. Mohd Nasir replied on the behalf of En.Zainuddin stating that, as a member of the selection committee for the pilot project sites, the 3 particular sites were selected basically to have a representation of the type of sites from the northern region, the eastern region and from the central region. The geographic criteria is not mentioned in the selection criteria report but was adopted as to have a better balance of selection and not concentrated on one area.

Session 6

Chairman
Speakers

Ir. Tan Hoo, Director General, Sewerage Services Department, MHLG
Mr. Hiroshi Abe, JICA Study Team Member
Mr. Munehiro Fukuda, JICA Study Team Member
Mr. M Raju, Chief Health Inspector, MP Seberang Perai

Question No.1. *En. Noor Mohamed Bin Mohd Hakiba (UPM) to Mr. Hiroshi Abe.*
With reference to Mr. Abe's presentation notes, page 13, second slide, on the use of Clean Development Mechanism (CDM), En. Noor Mohamed suggested that the figure as mentioned in the table may be questioned. The conversion may be in question as En. Noor Mohamed informed that 1 tonnes of methane is equivalent to 21 tonnes CO₂ equivalent. Furthermore, En. Noor Mohamed also informed that the Malaysian Government is not interested in trading the CHG at US\$5 per tonne CO₂, as the market price is about US\$20. The adjusted amount should be about RM400 million.

Answer No.1 Mr. Abe replied that the figures were based on emissions from levels C3 and C4 sites and only 30% of waste of them have been considered and thus the emissions are not much. As for the US\$5 figure, this is the present amount to be adopted but will increase in the future. En. Noor Mohamed's comments shall be taken into consideration and reviewed.

Question No.2 *En Mohd Azdan Bin Ashari (Alam Flora Sdn Bhd) to Mr. Munehiro Fukuda.*
En. Mohd Azdan enquired why is the waste quantities not considered for evaluation, as the more waste there are will require more countermeasures to mitigate the environmental problems.

Answer No.2 Mr. Fukuda replied that in order to accurately estimate the impact, all parameters will have to be considered, not just the quantity of waste but also the quality and hazardous substances present. However, for the present study and evaluation, an compromise has been adopted due to the lack of substantial information. The present evaluation will be based on currently available information collected from questionnaires from the Local Authorities.

Question No.3 *En Mohd Azdan Bin Ashari (Alam Flora Sdn Bhd) to Mr. Hiroshi Abe*
With regards to the CDM issue, can Mr. Abe confirm that landfill closure projects are eligible for the Carbon Credits?

Answer No.3 Mr. Abe replied that the CDM have a lot of conditions under the Kyoto Protocol and presently not applied for landfill closure. However, a proposal can be presented for their consideration.

The Chairman, Ir Tan Hoo, suggested the matter be referred to the Department of Environment for further clarification if required.

Question No.4 *Mr. Ng Han Kok (JICA Study Team Member) to Mr. M .Raju.*
With regards to Mr. Raju's presentation informing on the use of bamboo as leachate collection pipes, what has become of the bamboo, and are they still there after all these years?

Answer No.4 Mr. Raju replied that the bamboo pipes may still be there, however, if the bamboos have decayed, the rocks that were surrounding the pipes are still in place and formed channel for the leachate to flow.

Session 7

Chairman Y.Bhg Dato' Mohamad Bin Said, Director General, Local Government Department, MHLG

Panellists En. Ahmad Husni Hussain, EPU
Dr. Yasushi Matsufuji, Professor, Fukuoka University, Japan
Mr. Hisashi Yamauchi, JICA Study Team Leader
Dr. Mohd Nasir Hassan, Associate Professor, UPM

Opening Comments from the Chairman, Y.Bhg Dato' Mohamad Bin Said

Y.Bhg Dato' Mohamed stated that the solid waste issue is getting very critical for Malaysia and urgent solutions are required. Malaysia is facing with technical issues, social personal issues, environmental issues and also financial issues. The Government is doing its best to resolve these issues but Malaysian should also contribute towards resolving these issues and not depend entirely on the Government.

Closing Comments by En. Ahmad Husni Hussain, EPU

En. Ahmad highlighted even though the Solid Waste Management is a Federal Government issue. It was proposed that the Federal Government may bare the cost of CAPEX and OPEX whilst the State Governments and Local Authorities have a big role to play and are responsible for the implementation, enforcement, operations and monitoring of the facilities. The corporations of all these parties are crucial for the success of SWM.

Closing Comments by Dr. Yasushi Matsufuji

Dr. Matsufuji commented that Malaysia is now able to carry out its safe closure and have understood how to upgrade and improve on the landfills. However, we must also be aware of the environmental issues and work together to ensure environmental conservation and protect sustainable development. In the future, Malaysia can establish a suitable solid waste management system which is world recognised.

As the final message, Dr. Matsufuji stated, “Don’t (be) angry, don’t hurry up and don’t give up.”

Closing Comments by Mr. Hisashi Yamauchi

Mr. Yamauchi informed that the JICA Study Team will continue the study till October next year. The study will eventually stress upon 3 main issues, i.e. the funding issues; who shall bare the cost and sources of revenue; the institutional set up, who shall be responsible; and the registration system, to ensure data are updated and kept. Finally the guidelines will be produced and shall be practical and able to be improved upon in the future.

Closing Comments by Dr. Mohd Nasir Hassan

Dr. Mohd Nasir presented an analogy between landfill closure and solid waste management by comparing them to a rope and a bull, respectively. He commented that if the rope is more expansive than the bull, then there is something wrong with the system and have to be reviewed. Dr. Nasir felt that Malaysia will be the role model for the Asian region, second to Japan, in solid waste management. In future, all dumpsites will have to be closed and sanitary sites be provided. A comprehensive system of registering introducing “gazette” in all the landfill including closed ones, will have to be established to catalogue the size, type and quantity of waste. Malaysia need to understand the technology and science of landfill and improved upon them.

The MHLG, under the leadership of Dato’ Mohamed have spearheaded a large number waste management related events in the past few years. There is a paradigm shift toward advancement in SWM. The stakeholders all have a great role in SWM. However, we should not just look at the profit making side of SWM but must take the role to improve and worked toward better understanding of SWM and achieve our goals.

Closing Comments from the Chairman, Y.Bhg Dato’ Mohamad Bin Said

Y.Bhg Dato’ Mohamed commented that in Malaysia, different regions have their different types of waste and characteristics, that was why the 3 pilot projects were selected one in Penang, one in Pahang and the other in Selangor. In comparison with other Asian countries, our Malaysian waste will also differ. Malaysia should not just adopt SWM methods from other countries. Malaysian waste has about 80% moisture content as compare to Japan of 30%, thus Malaysia should develop its own system, suited for the type of waste here.

The most critical issue related to SWM is the cost, the financial issues. We need to have better sanitary landfills. The estimated cost to provide adequate sanitary landfill facility is RM10 for every cubic meter of landfill. As for incineration, it cost RM500,00 per tonne, thus for 17,000 tonne a day of waste generated in Malaysia, it will cost the Government about RM8 Billion.

There is also the need to keep proper data and information of the landfills. For every landfill recorded, there may be at least 5 illegal dumpsites of various sizes that are not registered.

Malaysians have to be educated to be more responsible for their waste, it is not just the responsibility of the LA or MHLG. Everyone has a role to play, including the other parties such as the NGOs, private sector and institutions. We have to use our initiative and our creativity to try to solve our problems. Y.Bhg Dato' Mohamed stressed to EPU to support the funding for safe closure, and asked the LAs to do their own effort.

If Malaysia is to be a 1st World country with a 1st World mentality, with a 1st World facility, we need to take care of our waste. How we are to do it will have to be decided later.

In closing, Y.Bhg Dato Mohamed took the opportunity to thank the participants for their patience, their perseverance and their commitment. Y.Bhg Dato' Mohamed also expressed his thanks to the Panellists, the JICA Study Team members, the speakers, and special thanks to the foreign guests from the neighbouring countries. Y.Bhg Dato' Mohamed also called upon the LAs to think seriously on the issues concerning the waste management and try to resolve them.

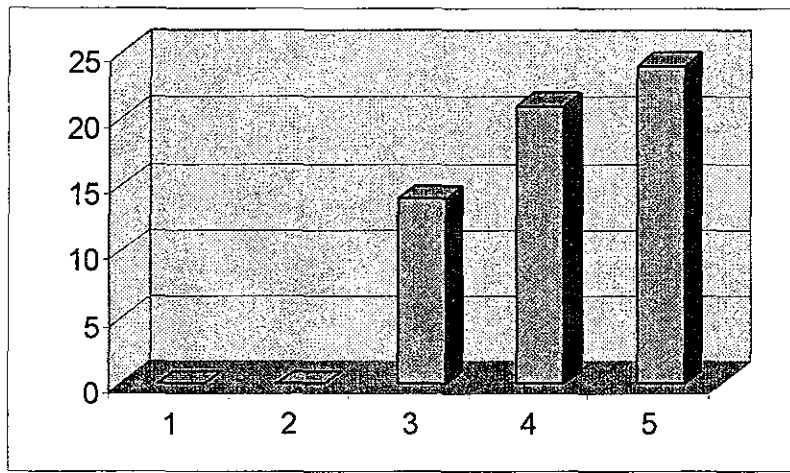
1. First Seminar on The Study on the Safe closure and Rehabilitation of Landfill Sites in Malaysia

SEMINAR EVALUATION
 (9 question/answer)

The participants are requested to assess the Seminar by marking from 1 (poor) to 5 (excellent) the aspects detailed below. The numbers of responses for each score are given for a total of 59 forms returned.

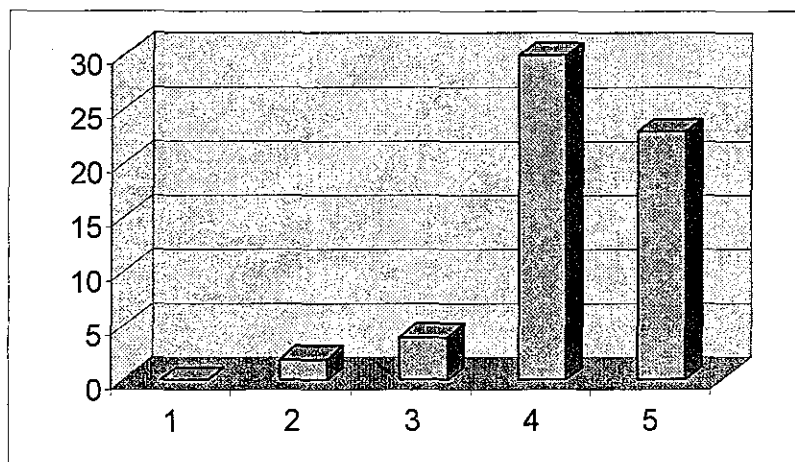
1. To what extent did the Seminar meet your expectations?

1 (poor)	2 ←	3 (average)	→ 4	5 (excellent)
0	0	14	21	24



2. To what extent is this Seminar useful to your activities?

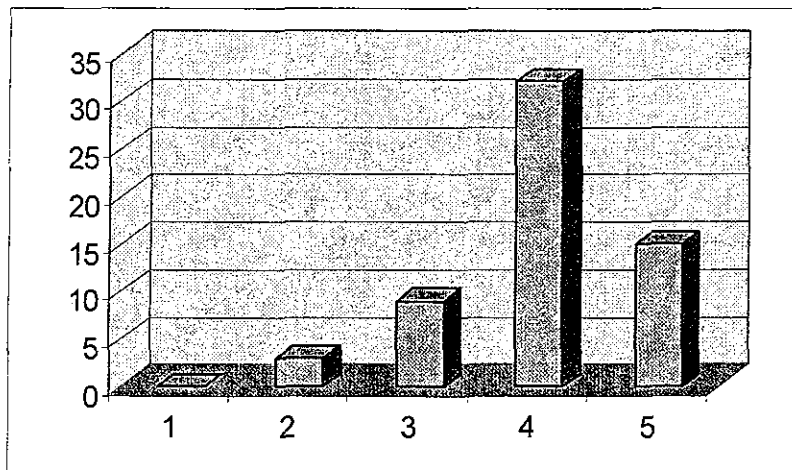
1 (poor)	2 ←	3 (average)	→ 4	5 (excellent)
0	2	4	30	23



3. How do you appreciate the information presented in this Seminar?

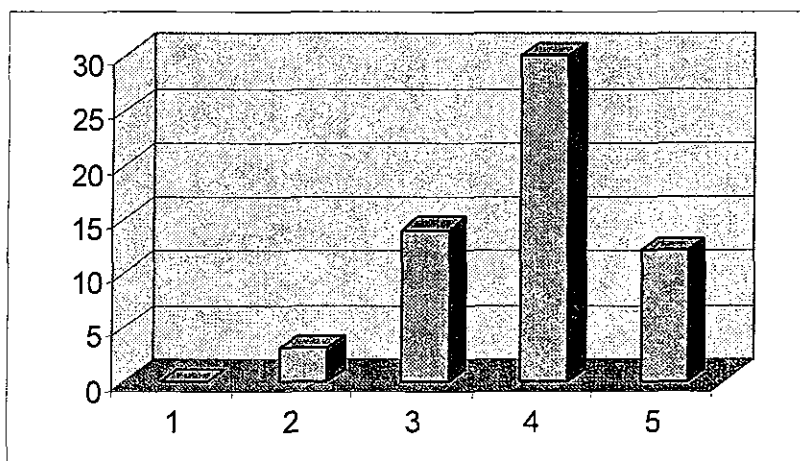
1 (poor)	2 ←	3 (average)	→ 4	5 (excellent)
0	3	9	32	15

1. First Seminar on The Study on the Safe closure and Rehabilitation of Landfill Sites in Malaysia



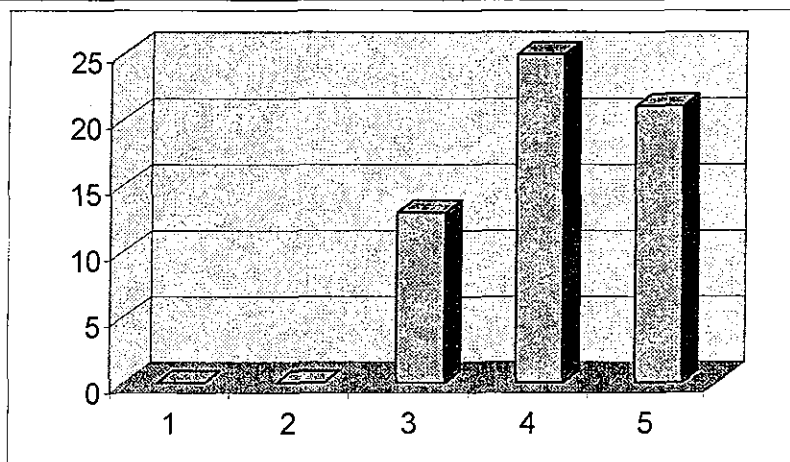
4. How do you appreciate the presentation methods used in this Seminar?

1 (poor)	2 ←	3 (average)	→ 4	5 (excellent)
0	3	14	30	12



5. How do you appreciate the presentation materials and the Seminar support?

1 (poor)	2 ←	3 (average)	→ 4	5 (excellent)
0	0	13	25	21



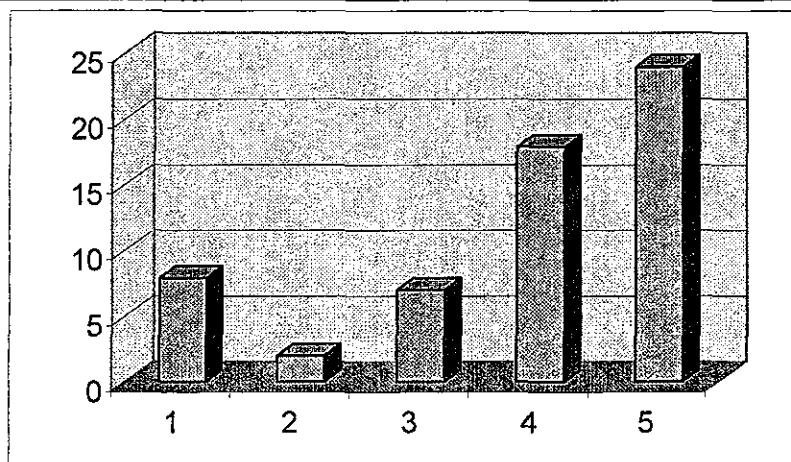
6. Please indicate below any other impressions, comments or suggestions.

1. First Seminar on The Study on the Safe closure and Rehabilitation of Landfill Sites in Malaysia

- More workshop or discussion session could be conducted in the future (in a small group).
- More of this and as follow up to this Seminar to be organised.
- The time is too short, need time to absorb information & read papers.
- Well organised and interesting subject to discuss.
- Need more information about Malaysia landfill rather than Japan landfill because most of the speakers are not given speech about actual landfill issues in Malaysia.

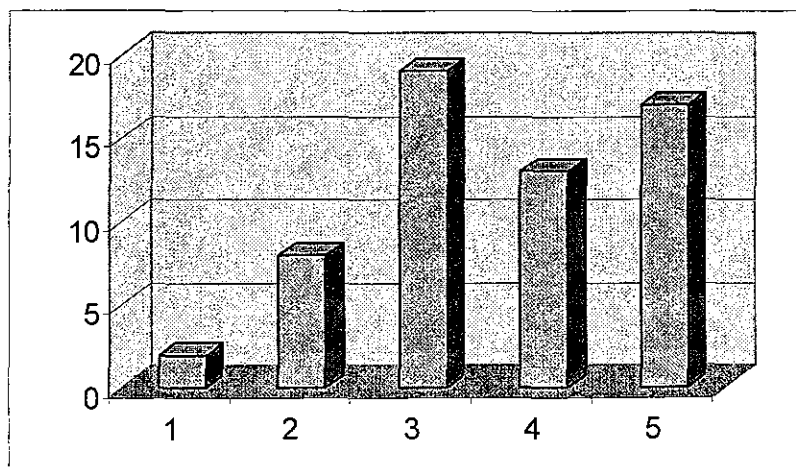
7. Do you intend to implement the Safety Closure & Rehabilitation of the landfill site of your own locality?

No site / No intention	Weak intention	Average	Strongly	Very strongly
8	2	7	18	24



8. What do you feel about the possibility for Safety Closure & Rehabilitation of the landfill site of your own locality within next 5 years?

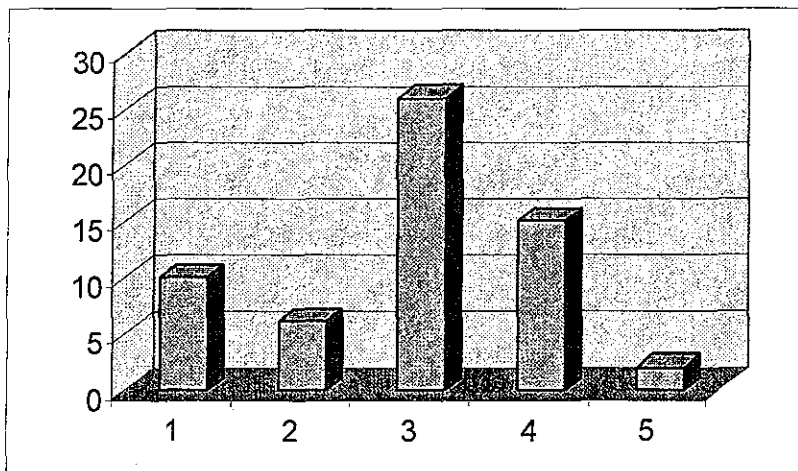
Impossible	Limited chance	Possible	Very likely	Surely
2	8	19	13	17



9. What do you need most to achieve Safety Closure & Rehabilitation of the landfill site of your own locality? Please Prioritise. (1 - least need, 5 - most need)

1. First Seminar on The Study on the Safe closure and Rehabilitation of Landfill Sites in Malaysia

Technology	Training	Finance Budget	Clear Policy	Public support
10	6	26	15	2



1. First Seminar on The Study on the Safe closure and Rehabilitation of Landfill Sites in Malaysia

Date : 18th & 19th September, 2003

Place : Tun Hussein Onn Hall, Putra World Trade Centre, Kuala Lumpur

1st Day: September 18th (Thursday)

08:30 – 09:00	Registration
09:00 – 09:40	Opening Ceremony <ol style="list-style-type: none">1. <i>Welcome Speech by Ir. Fong Tian Yong</i> <i>Chairman of Organising Committee MHLG</i>2. <i>Welcome Speech by Mr. Toshio HIDA,</i> <i>Representative of JICA Malaysia (Co-Organizer)</i>3. <i>Opening Address by Y.Bhg Dato' Lokman Hakim bin Mohd Jasan</i> <i>Secretary General Min. of Housing and Local Government,</i> <i>Malaysia</i>
09:40 – 10:00	Tea Break
SESSION 1	Chairman Y.Bhg Datuk Ir. Dr. M.S. Pillay <i>Director of Engineering Services, MOH</i>
10:00 – 11:00	Concept of Safety Closure of Landfill Sites in Japan <i>Dr. Yasushi MATSUFUJI, Professor, Fukuoka University, Japan</i>
11:00 – 11:45	Towards Improvement of Landfill Sites in Malaysia <i>En. Abdul Halim Abdul Hamid, Local Government Dept, MHLG</i>
11:45 – 12:30	Overall Objective and Goal of the JICA Study <i>Mr. Hisashi YAMAUCHI, JICA Study Team Leader</i>
12:30 – 13:00	Q & A Session
13:00 – 14:00	Lunch Break
SESSION 2	Chairman En. Mohd Nazeri bin Salleh <i>Deputy Director, Local Government Dept. MHLG</i>
14:00 – 14:45	Guidelines on Safety Closure of Landfill Sites in Malaysia <i>Mr. Kohshi TAKAHATA, JICA Study Team Member</i>
14:45 – 15:00	Q & A Session
15:00 – 15:15	Tea Break
SESSION 3	Chairman Mr. Hisashi YAMAUCHI, <i>JICA Study Team Leader</i>
15:15 – 17:00 related to their	Country Report Presentation : Landfill situation and issues closure in neighboring countries Representatives from : Indonesia, Philippine, Thailand, Vietnam Laos & Cambodia.
17:00 – 17:30	Q & A Session

2nd Day: September 19th (Friday)

SESSION 4 **Chairman** ***Ir. Fong Tian Yong***
Deputy Director, Local Government Dept. MHLG

09:00 – 09:40 **Policy and Strategy for Solid Waste Management in Malaysia**
En. Ahmad Husni Hussain, Economic Planning Unit, PM's Department

09:40 – 10:20 **Local Authorities Practices for Resolving Landfill Issues in Japan**
Mr. Koichi KUBOKURA, Fukuoka City Environmental Bureau, Japan

10:20 – 10:30 Q & A Session

10:30 – 10:45 Tea Break

SESSION 5 **Chairman** ***Y.M. Engku Azman Tuan Mat***
Director, Local Government Dept. MHLG

10:45 – 11:25 **Case Study of Landfill Closure in Kuala Lumpur**
Dr. Mohd Nasir Hassan, Assoc. Professor,
University Putra Malaysia (UPM)

11:25 – 12:05 **Plan and Progress of Pilot Projects of the JICA Study**
En. Zaimuddin Arshad AMN, JICA Study Team Member

12:05 – 12:20 Q & A Session

12:20 – 14:30 Lunch Break

SESSION 6 **Chairman** ***Ir. Tan Hoo***
Director General, Sewerage Service Dept.
MHLG

14:30 – 15:10 **Action Plan for Safety Closure of Landfill Sites in Malaysia**
Mr. Hiroshi ABE, JICA Study Team Member

15:10 – 15:50 **Environmental and Social Issues of Landfill Sites in Malaysia**
Mr. Munehiro FUKUDA, JICA Study Team Member

15:50 – 16:20 **Landfill Management in Local Authorities in Malaysia**
Mr. M. Raju, Chief Health Inspector, MP Seberang Perai.

16:20 – 16:30 Q & A Session

SESSION 7 **Chairman** ***Y.Bhg Dato' Mohamad Bin Saib,***
Director General,
Local Government Dept. MHLG

16:30 – 17:30 **Panel Discussion on Landfill Safety Closure**
Panelists : Representative from MHLG, EPU, DOE,
Prof. Yasushi MATSUFUJI (Chairman of JICA Advisory Committee)

1. First Seminar on The Study on the Safe closure and Rehabilitation of Landfill Sites in Malaysia

Mr. Hisashi YAMAUCHI (JICA Study Team Leader)

Dr. Mohd Nasir Hassan, (Assoc. Professor, UPM)

17:30

Closing & Refreshment

2nd Seminar for The Study on the Safe closure and Rehabilitation of Landfill Sites in Malaysia

Questions & Answers and Panel Discussion Sessions - Minutes

Day 1, September 28th, 2004

Opening Ceremony

1. Welcome speech by Mr. Akira Murata, the Resident Representative, JICA Malaysia Office.

Mr. Murata expressed his profound gratitude to the Government of Malaysia, especially to the Local Government Department of the Ministry of Housing and Local Government, MHLG, for their cooperation and support to the JICA Study particularly to the JICA Study Team.

Mr. Murata said that with Malaysia's rapid and significant economic growth in the past 20 years, the subsequent urbanisation has increased the pressure on urban environmental problems especially on the solid waste management and management of landfill sites. Mr. Murata reiterated that about 170 landfill sites are being operated in Malaysia and only about 10% are classified as sanitary landfills or controlled landfills. The others were operated as so-called open dumping sites. Such operations create serious environmental menace resulting in waste scattering, surface and groundwater pollution, emission of obnoxious gasses and smells. What made the situation worse was that in the past few years, about 60 landfill sites were closed but without any safe closure measures. Thus, in order to tackle the issue, in February 2003, MHLG and JICA jointly conducted the Study on Safe Closure of Landfill Sites in Malaysia. The main objectives are to determine the most suitable ways to safely close the landfills and to clarify the actions to be taken by the Government of Malaysia to achieve the objectives.

Mr. Murata informed that thanks to the tremendous efforts of MHLG and the JICA Study Team, the Study is now coming to an end and have come up with new findings and solutions proposed for action for the Government of Malaysia. The two days seminar, jointly organised by MHLG and JICA, will seek to address and present the Study results, including the guideline and action plan, policy and funding system, pilot project results, and the presentation by the two prominent academicians, namely Prof. Dr. Y. Matsufuji and Prof. Dr. Nasir bin Hassan. The seminar is also unique for having invited frontline solid waste management experts from the neighbouring countries, namely China, Indonesia, Myanmar, Nepal, Philippines, Thailand, Vietnam and Bangladesh, to extend their views and share their knowledge.

Mr. Murata understood that it is an uphill task to implement all the safe closure works but if the problem is not tackled now, the situation will deteriorate further and will make matters much more difficult to resolve.

Finally, Mr. Murata expressed, on behalf of JICA, their gratitude and appreciation to MHLG, its official and staff, for all their assistance and corporation towards making the Study and seminar a success. Appreciation were also extended to the participants of the seminar.

2. Opening address by MHLG

The opening address by MHLG was officiated by Ir. Fong Tian Yong, Deputy Director General, Local Government Department, MHLG. Ir. Fong expressed the apologies on behalf of the Minister and the Director General of the Local Government Department, for their absence.

Ir. Fong, on behalf of the Ministry, thanked the JICA Study Team, in particular, for all their efforts and expertise for carrying out the Study and compiling the detail framework and Guidelines on the safe closure of landfill sites in Malaysia. Ir. Fong informed that the Ministry is still lacking in expertise and know-how on solid waste management. Although the Ministry have the technical knowledge and the team of resource persons but most of them lack the hands-on experience in SWM activities, especially in the emerging technologies, environmental requirements, monitoring, etc.

Ir. Fong further expressed that the key trust of the national policy is on the environmental system and development as a means in the enforcement of the long-term growth for Malaysia. At present, there are about 18,000 tonnes per day of waste generated in Malaysia, and disposal by landfilling is the most preferred method. Better disposal alternatives should be put in place soon together with the waste minimisation and recycling programmes.

Ir. Fong informed that the Government have allocated RM 50 million for the improvement of some of the existing landfill sites in Malaysia. Now, with the recommendation and guidelines as prepared by the JICA Study, the upgrading and rehabilitation works can be enhanced and implemented properly. The Government have also stated that all future new landfill sites must be sanitary landfills and must be provided with suitable facilities and also integrated with the closure plan.

Ir. Fong stated that MHLG has just received the handbook from EPU on the Economic Instrument for Environmental Initiative in Malaysia. One of the item mentioned is the "Stick and Carrot" approach. If the "carrot" approach does not work, then the "stick" will have to be used, i.e. as economic instruments in the form of taxes, charges, subsidies, incentives, grants, deposit-refund system, performance bonds, market creative instruments, etc. The "Polluters Pay Principle" may also be invoked to have the public bare some of the cost of solid waste management.

Finally, Ir. Fong expressed the Ministry's thanks and gratitude to the JICA and to the Study Team for organising this 2nd Seminar. The Seminar is the continuation of the 1st Seminar held in September 2003, and is mainly for the Study Team to present their findings and recommendations. This seminar will also have a number of presentations and sharing of experiences by representatives from the neighbouring countries. With this note, Ir. Fong, on behalf of the Minister, declared the Seminar opened.

Day 1: Session 1 – Questions & Answers

Chairman Ir. Fong Tian Yong, Deputy Director General, Local Government Department, MHLG

Speakers Dr. Yasushi Matsufuji, Professor, Fukuoka University, Japan
Mr. Hisashi Yamauchi, JICA Study Team Leader
En. Mohd Nazeri Salleh, Principal Assistant Director, PIU, MHLG

Question No.1. *Tn. Hj. Jalal Bongkik (Sewerage Service Department (JPP)) to Dr.Matsufuji.*

Tn. Hj Jalal enquired about the difference in the cost of safe closure of open dumpsites are compared to well operated sanitary landfills.

Answer No.1 Dr. Matsufuji replied that the costs are dependent on the scope of work and rehabilitation required. Based on his experience, the cost of safe closure of open dumpsite are generally 10 times that for the safe closure of well operated sanitary landfills.

Question No.2. *Tn. Hj. Jalal Bongkik (Sewerage Service Department (JPP)) to En.Nazeri*

Tn. Hj Jalal enquired whether MHLG has the information on how many residential developments are on closed landfill sites.

Answer No.2 En. Nazeri replied that at present MHLG does not have such information as the landfills and development issues are handled by the Local Authorities. However, based on recommendations as suggested by the Study, MHLG will look into the setting up of the landfill registration and database system.

Question No.3. *Tn. Hj. Jalal Bongkik (Sewerage Service Department (JPP)) to Mr.Yamauchi*

Tn. Hj Jalal enquired what is the recommended safe buffer zone for development surrounding a landfill site taking into consideration of the underground gas migration problems.

Answer No.3 Mr. Yamauchi explained that there is no fixed recommended buffer zone and the gas migration is generally subject to the specific soil condition of the site. For example, if the soil is clayey, then the rate of gas migration is low as compare to sandy soil that are more porous. Thus, the safe buffer zone may vary. However, the important countermeasure is to install gas ventilation systems to vent the gasses and to reduce the build up of gasses.

Question No.4. *Chairperson, Ir. Fong to representative from EPU*

Ir. Fong enquired whether the EPU have any funds set aside for safe closure of landfills and how the funds are allocated.

Answer No.4 The answer was replied by En. Dzauddin Mohamad, Social Service, EPU. En. Dzauddin explained that at present there are no specific policy on funding for landfill safe closure, however, EPU has in the past given financial assistance to the Local Authorities, through MHLG, for the upgrading of landfill sites. Such assistances were specifically requested by the Local Authorities.

En. Dzauddin further explained that EPU will look into the setting up of the new funding system and will review the proposals as recommended in the Study. EPU may consider the proposal for inclusion into the 9th Malaysian Plan and suggested MHLG to propose the funding mechanism to EPU for consideration.

Question No.5. *Mr. Albert A Magalang (Executive Director, National Solid Waste Management Commission, Philippines) to the panel.*

Mr. Magalang enquired whether the Study has considered the alternative source of funding by obtaining the certified emission reduction (CER) through the use of Clean Development Mechanism (CDM) under the Kyoto Mechanism of United Nations Framework Convention on Climate Change (UNFCCC).

Answer No.5 Dr. Matsufuji replied that by converting the Aerobic system to the Semi-aerobic system, about 40% of greenhouse gases can be reduced and hence should be able to qualify for CDM funding.

Mr. Yamauchi explained that the CDM consideration has been included in the Study Report. Although the potential amount of greenhouse gasses emission reduction is large enough, not all of them can obtain the CER that can be traded in the expected carbon market. Nevertheless, the use of CDM is still an option worth considering.

Question No.6. *Mr. Brian Makepeace (MB Technology (M) Sdn Bhd) to Dr.Matsufuji*

Mr. Makepeace enquired what is the recommended aftercare (post closure management) period for the semi-aerobic landfill after safe closure. He further informed that in the United Kingdom, the recommended period is 60 years.

Answer No.6 Dr. Matsufuji replied that there is no fixed recommended aftercare period and are generally dependent on the condition of the closed landfill and also on how it was operated, i.e. the composition of the waste, height and thickness of the waste layers, the compaction, climate, etc. Generally, the suggested period is from 10 to 20 years after safe closure.

Question No.7. *Mr. Brian Makepeace (MB Technology (M) Sdn Bhd) to Mr.Yamauchi*

Mr. Makepeace enquired what are the main criteria for selection of the 3 Pilot Projects sites.

Answer No.7 Mr. Yamauchi explained that there were 3 main criteria used to select the 3 Pilot Project sites, they are i) their geographical location, (i.e. site located in northern zone, eastern zone and central zone), ii) the safe closure considerations, i.e. (Ampang Jajar PP - safe closure of landfill that has been operated under improved conditions, Pekan Nenasi PP – model for rehabilitation of landfill located in wetlands, and Ampang Jaya PP – landfill previously operated as an open dumpsite and poorly located), and iii) the status of the sites (i.e. closed site for Ampnag Jaya, about-to-close site for Ampang Jajar and still-in-operations site for Pekan Nenasi).

Question No.8. *Mr. Brian Makepeace (MB Technology (M) Sdn Bhd) to En. Nazeri*

Mr. Makepeace enquired whether the Ministry has considered the prospect of introducing Waste-to-Energy (WTE) concept at some of the the landfill sites in Malaysia.

Answer No.8 En. Nazeri replied that MHLG has been studying such options and seeking technical advises on the issue. The MHLG is also looking into the use of landfill gasses for power generation, however due to the relatively small size of the landfill, the rate of generation methane gas is low, and thus not particularly viable. Nevertheless, MHLG is still looking into other form of WTE projects.

Question No.9. *Mr. Lee Khok Fook (MP Sandakan, Sabah) to the Panel*

Mr. Lee suggested that the Study should emphasise more on the proper operations of existing landfill sites so that the eventual cost of closure could be reduced. Mr. Lee also queried that with the Study's proposal to impose additional tipping fee to cater for the additional cost for safe closure and post closure management, this will definitely increase the cost charged to the population and will not be well received, furthermore, this will also encourage more illegal dumping.

Answer No.9 Mr. Yamauchi replied that of course the proper operations and management of the operating landfills are necessary to reduce the eventual cost of closure. However, majority of the landfills are badly located and thus will still require some sort of rehabilitation work to improve the conditions of the site. Furthermore, the Study also concerned about the already closed sites that were not closed properly, and safe closure and rehabilitation work are urgently required for these sites.

As for the Study's recommendation for additional tipping fee, the Study recommends the tipping fee to be collected at the landfills by the landfill operators from the waste collection and transportation agents.

Ir. Fong further explained that with the privatisation of the municipal waste collection services to the 3 concessionaires, they will be responsible for the transportation of the waste to the landfill sites and should not dump the waste illegally. As for the other private contractors, stricter enforcement should be carried out by the Local Authorities to check on and curb the illegal dumping activities.

Day 1: Session 2 – Questions & Answers

Chairman En. Huszian Husin, Director, Environment Health Engineering Division, MHLG

Speakers Mr. Hiroshi Abe, JICA Study Team Member

Question No.1. *Mr. Lee Khok Fook (MP Sandakan, Sabah) to Mr. Abe*

Mr. Lee enquired whether there is the guideline for determining the closure levels for the landfills, and further enquired whether the proposed subsidence rate of 2cm/year should be based on the depth of the landfills and they thickness of the layers.

Answer No.1 Mr. Abe replied that the guideline for determining the closure levels for the landfills are stated in the Technical Guideline prepared by this Study. It described the priority and how to determine and select the levels. As for the 2cm / year subsidence rate, Mr. Abe stated that many discussion on this issues have been made, of course the subsidence rate is highly dependent on the type of landfill structure. The proposed 2cm/year subsidence rate is

just an indicator for the stability of the landfill, i.e. for the larger deeper landfills, subsidence will be greater and it may take a longer time to reach the 2cm/year rate, hence the site should not be utilised so soon.

Question No.2. *Mr. Wong Yun Sang (Permanent Secretary, Sabah) to Mr. Abe*

Mr. Wong enquired whether the guideline included the safe closure and rehabilitation for landfills on swampy land.

Answer No.2 Mr. Abe replied that the guideline have included such provisions since majority of the landfills in Malaysia were located on swampy area. For example, the 2 of the 3 pilot projects were for the landfills located on swampy area, i.e. Ampang Jajar and Pekan Nenas.

Question No.3. *Mr. Albert A Magalang (Executive Director, National Solid Waste Management Commission, Philippines) to the panel.*

Mr. Magalang enquired whether the Study has considered the conversion of open dumpsites to controlled tipping sites.

Answer No.3 Mr. Abe explained that the present Study is on safe closure and rehabilitation of landfill sites, hence it did not consider the issue on conversion nor on the operations in great details. However, the operations issues are addressed in the "Technical Guideline on Sanitary Landfill, Design and Operation, Revised Draft, 2004" that was prepared in 1990.

Day 1: Session 3 – Questions & Answers

- Chairman Mr. Hisashi Yamauchi, JICA Study Team Leader
- Speakers
1. Prof. Nie Yongfeng, *Professor, Dept of Environment Science and Engineering, Tsinghua University, China.*
 2. Ms. Meita Norinastiti, *Head of section for Cleansing Business & Community Participant, Dept for City Cleaning, Jakarta, Indonesia.*
 3. Mr. Anwar Hossain Patwary, *Dhaka City Corporation, Nagar Bhaban, Dhaka, Bangladesh.*
 4. Mr. Lin Tun Myint, *Head of Department, Pollution Control Dept, Yangon City Development Committee, Yangon, Myanmar.*
 5. Mr. Albert A Magalang, *Executive Director, National Solid Waste Management Commission, Quezon City, Philippines.*
 6. Mr. Paisan Padungsirikul, *Director, Solid Waste Management Section, Pollution Control Department, Bangkok, Thailand.*
 7. Mr. Surya Man Shakya, *General Manager, Solid Waste Management & Resource Mobilization Center, Ministry of Local Development, Nepal.*
 8. Ms. Nguyen Thi Hoang Lan, *Head of International Relation Department, Hanoi Urban Environment Company, Vietnam.*

Question No.1. *Mr. Lee Khek Fook (MP Sandakan, Sabah) to Ms. Meita Norinasititi,*

Indonesia.

Mr. Lee stated that in Ms. Meita's presentation, they have been a number of waste management technologies used in Indonesia, Mr. Lee enquired whether there have been any comparisons made on these technologies, and how effective and beneficial were they.

Answer No.1 Ms. Meita replied that they are still in the process of evaluating the proposals by the 6 private companies for the 6 different types of technologies. Ms. Meita further explained that her department will study the effectiveness of each and every technology.

Question No.2: *Mr. Mahmoud Riad (JICA Study Team, Nepal) to Mr. Anwar Hossain Patwary, Bangladesh.*

Mr. Riad required clarification to Mr. Anwar's reference to a landfill site next to a private university, whether it was built by the university or by the local authority.

Answer No.2 Mr. Anwar explained that the university had purchased the plot of low lying land at a very cheap price and later found the backfilling with earth was too costly. Hence the university requested the local authority to use the land as a landfill in order to backfill the land to their required level.

Question No.3. *Mr. Hisashi Yamauchi (JICA Study Team Leader) to Prof. Nie Yongfeng, China.*

Mr. Yamauchi stated that he has visited China and noticed that the solid waste management activities at the Eastern part of China are more advanced than the Central and Western part of China, and enquired why is it so.

Answer No.3 Prof. Nie explained that the Eastern part, or along the coastal areas, are more developed and urbanised, and thus have better MSW management and services. The Central and Western China are mostly agriculture land and countryside and are difficult to provide with MSW collection services, and are generally left to the population's self-disposal methods.

Question No.4. *Mr. Takuya Murata, (JICA Tokyo) to the Panel*

Mr. Murata enquired what measures have been carried out with regards to safe closure of landfill in the foreign participants' respective countries.

Answer No.4 Prof. Nie, China, explained that the major problem with operations and closure of landfills is in the funding. China has developed various technologies but found it difficult to implement due to the lack of funds. China also needs stricter legislations to ensure operators of landfills comply with the regulations and adhere to proper operations and closure procedures.

Ms. Meita, Indonesia, reiterated Prof. Nie's comments and explained that they do not have sufficient funds to operate landfills and have no additional funds to close landfills.

Mr. Anwar Hossain Patwary, Bangladesh, stated that at present there are no plans to implement safe closure of landfill sites due to the lack of funds. However they may consider such matter in the near future. Nevertheless, Bangladesh is currently applying for CDM funding for their landfill gas recovery projects.

Mr. Lin Tun Myint, Myanmar, stated that the main problem is with the funding and they are not able to carry out the necessary activities.

Mr. Albert A Magalang, Philippines, stated that as with the funding, he is aware of the various development loan schemes provide by Japan and by various other countries. However, due to the lack of Governmental interest, such loans were not taken up or utilised. Mr. Magalang proposed that the donor countries should make the loan more attractive in order to attract Government to utilise them.

Mr. Paisan Padungsirikul, Thailand, explained that Thailand is in the process of privatisation of their SWM activities and landfill operations, and will be up to the responsibility of the private operators to ensure the landfill are operated and closed properly. Some of the smaller landfills will have to be closed and moved on to the larger centralised landfills. The closed sites will have to be closed in proper manner but are generally hampered due to lack of funds.

Mr. Surya Man Shakya, Nepal, stated that there is only one landfill site in Nepal and it is about 14 years old and is to be closed soon. Steps are being taken to close the landfill safely however lack of funds is a major problem and slowing the progress. Nepal may request JICA for additional assistance in the closure process and funding.

Ms. Nguyen Thi Hoang Lan, Vietnam, stated that Vietnam has allocated some funds for upgrading some of their landfills to improve the leachate treatment and gas venting facilities. The issues related to safe closure have not been considered yet.

Mr. Yamauchi concluded that the sentiments of the panel lie on the fact that funding is still the biggest problem with landfill management. However, the issues should be raised and landfills should be properly operated and managed and this should eventually reduce the cost of safe closure.

Day 2: Session 4 – Questions & Answers

Chairman En. Zainuddin Arshad (JICA Study Team Member), representing Y.Bhg. Datuk
Ir. Dr. M.S. Pillay, Director, Engineering Services Division, Ministry of Health.
Speakers Dr. Hj. Romli Bin Hj. Awang, Majlis Perbandaran Seberang Perai
Dr. Nasir Bin Hassan, Professor, Universiti Putra Malaysia

Question No.1. *Mr. Lee Khek Fook (MP Sandakan, Sabah) to Dr. Hj Romli*

Mr. Lee enquired how to ensure that the leachate and gas collection pipes are not blocked or clogged. Furthermore, what steps did MPSP carry out in pilot project to ensure that surface cracks will not occur.

Answer No.1 Dr. Nasir, replied on behalf of Dr. Hj Romli, explained that if the pipes have been installed in accordance to the guidelines, i.e. suitably sized to cater for the calculated amount of leachate, and installed properly with rocks and gravels surrounding the pipes, then the perforations or holes on the pipes should not be blocked. With the rocks surrounding the pipe, they act as filters and only allowing the leachate to pass through. The pipes should be laid at a gradient so that the leachate will flow freely to the collection pond.

As for the ensuring surface crack will not occur, Dr. Hj. Romly explained that a layer of topsoil have been laid and also provided with a layer of vegetation cover, i.e. grass. Small cracks will appear but inspection and repairs of the cracks are being carried out regularly to ensure that the small cracks will not develop into bigger cracks.

Question No.2. *Mr. Anwar Hossain Patwary, (Dhaka City Corporation, Bangladesh) to Dr. Hj Romli*

Mr. Anwar requested clarification on what is meant by the term landfill mining.

Answer No.2 Dr. Hj. Romli explained that landfill mining involves the removal of the waste from one site to another site in a safe and proper manner. This is to allow for redevelopment of the mined site for other uses. During the mining, further separation and sorting of the decomposed or decomposing waste can be carried out to recover any recyclables. Instead of waiting for the existing waste to decompose and stability at the present site, they can be removed to another site and allow the present side to be reused for re-development.

Question No.3. *Pn Kamariah Bte Mohd Noor (Environment Idaman Sdn Bhd) to the panel*

Pn. Kamariah enquired when is the best time for landfill mining, i.e. can it be carried out during operations or after closure.

Answer No.3 Dr. Nasir explained that he is not familiar with this concept and requested the JICA expert Mr. Takahata to reply.

Mr. Takahata explained that landfill mining is basically the removal of the waste from one site to another site for various reasons, i.e. it could be for safety reasons, for recovery of recyclables or for releasing the present land for redevelopment. This can only be carried out provided the waste from the mined landfill is taken and disposed of at another sanitary landfill. There is not precise rule stating when the landfill can be mined, the recommended period is 2 years or longer, depending on the type of waste. Generally the waste must be already in advance decomposition and not fresh.

Mr. Takahata further explained that landfill mining is not practiced in Japan since Japan do not have sufficient space at the existing landfill site to receive the mined waste. However, this is practiced in USA and in Europe where they have excess capacity at the landfills to receive such waste.

Day 2: Session 5 – Questions & Answers

Chairman Y.M. Engku Azman Bin Tuan Mat, Director, Project Implementation Unit, MHLG

Speakers Mr. Kohshi Takahata, JICA Study Team Member
Mr. Munehiro Fukuda, JICA Study Team Member

Question No.1. *Mr. Liew Shan Sern (MB Technology (M) Sdn Bhd) to Mr. Fukuda*

Mr. Liew enquired whether the treated leachate effluent discharged from the landfill sites can meet with the effluent quality standards as prescribed in the Environment Quality Act, Malaysia. If not, should be another set of standards for landfill treated effluent.

Answer No.1 Mr. Fukuda explained that the Standard used were dependent on whether there is a water intake point downstream of the effluent discharge point, i.e. Standard A for the site with a water intake point downstream, and Standard B for without.

As for the Pilot Project, Ampang Jajar and Pekan Nenas qualified for Standard B, whilst Ampang Jaya is Standard A. Based on the preliminary results from the monitoring, the quality of the effluent discharge at Ampang Jaya is not desirable and further treatment facility is urgently required to be installed at the site. For this, the Local Authority in charge should take the

necessary action immediately.

Question No.2. *Mr. Kiran Ulak (Foreign Participant from Nepal) to Mr. Fukuda*

Mr. Kiran requested for more information or literature for the Contingent Valuation Method (CVM).

Answer No.2 Mr. Fukuda explained that there are various methods available to carry out the CVM, and majority of these are available through the internet.

Question No.3. *Mr. Peter Ho Yueh Chuen (Perunding Utama Sdn Bhd) to Mr. Fukuda*

Mr. Ho stated that although the methodology for determining the Closure Levels have been included in the guidelines and Study reports, whether Mr. Fukuda could explain briefly the process again.

Answer No.3 Mr. Fukuda explained that the procedures for determining the closure level for a particular site is dependent on the potential environmental impact to the site based on preliminary site inspections and brief investigations. Risk levels were assigned to a set of key parameters, i.e. such as the type and location of the site, the operations, the availability of facilities, proximity to water intakes, proximity to populated areas, etc. Such parameters were also assigned with a weigh factor base on the impact or potential risks. Mr. Fukuda further explained that the Study had conducted two technical workshops previously whereby the participants were asked to determine the weight factors for each of the parameters based on the importance and potential impact.

The Chairman, Engku Azman, added that in the future all new landfills will have to be designed to the highest level and thus should also be closed to the highest closure level. As for the existing landfills, the highest level should be targeted provided there are enough funds and resources to do so. The Chairman further explained that the present Study only reviewed the situation of the existing landfills and proper site-specific investigations are required to actually identify the risks and impacts.

Question No.4. *Pn Kamariah Bte Mohd Noor (Environment Idaman Sdn Bhd) to the panel*

Pn. Kamariah stated that the Study had carried out the technical evaluation and ebvironmental evaluation for the 3 Pilot Projects, however, there is no indication on the financial evaluation and the human resources evaluation. Pn. Kamariah enquired whether such evaluation will be carried out. Without such data, how can the future planners determine the financial feasibility of the safe closure.

Answer No.4 Mr. Fukuda explained the Pilot Projects were more concerned with the environmental and technical impacts, and thus financial evaluation was not considered.

Mr. Takahata further explained that it is difficult to ascertain the financial benefits related to the work carried out as the safe closure is a continuous process and need to be monitored for a long period of time.

The Chairman, Engku Azman, added for future closure, the Ministry should decide whether, based on the proposals and recommendations by the JICA Study, the amount of funds required to implement the safe closure is feasible or not. The Ministry will have to study the recommendations and propose to the Finance Ministry for funds and allocations.

Day 2: Session 6 – Panel Discussion - Questions & Answers

Chairman	Ir. Fong Tian Yong
Panellists	Y.M. Engku Azman Bin Tuan Mat, Director, Project Implementation Unit, MHLG Dr. Yasushi Matsufuji, Professor, Fukuoka University, Japan Mr. Hisashi Yamauchi, JICA Study Team Leader Prof. Nie Yongfeng, Professor, Tsinghua University, China. En. Dziauddin Bin Mohamad, Principal Assistant Director, Social Services Division, Economic Planning Unit

Panellists Remarks

1. *En. Dziauddin Bin Mohamad, EPU*

En. Dziauddin informed that the issues concerning Solid Waste Management (SWM) in Malaysia is fairly new and was first highlighted in the 6th Malaysian Plan. Furthermore, the issues with safe closure of landfills were not mentioned in any of the Plans, however, this issue may be raised in the forthcoming 9th Malaysian Plan.

In 1995, the Government of Malaysia revamp the activities of SWM services by privatising the municipal waste collection services. The responsibilities of SWM has been centralised and revert to Federal Government control, under the Ministry of Housing and Local Government. The Local Authorities will only be responsible for monitoring and upgrading the existing service and facilities. For such activities, the LAs can submit their applications for financial assistance to MHLG. The Ministry of Finance have allocated some funds to MHLG for such usage.

However, for the future plans, the EPU is still reviewing the present mechanism and will decide on the issues accordingly.

2. *Dr. Yasushi Matsufuji, Advisor to JICA*

Dr. Matsufuji expressed his thanks to the participants of the seminar and stated that the Study has presented the technical aspects on how to carry out the safe closure and rehabilitation of landfills. However, the important part is for the Government of Malaysia to set up the landfill registration system and also to establish the funding mechanism. Dr. Matsufuji is pleased to hear that the Safe Closure issues will be highlighted in the next 9th Malaysian Plan, and hoped that the recommendations and action plans as proposed in the Draft Final Report should be implemented as soon as possible.

3. *Y.M. Engku Azman Bin Tuan Mat, MHLG*

Engku Azman informed that the present solid waste management activities were only started in 1988 with the ABC Plan and have since developed to a fairly advanced stage. The various government programmes and activities have raised a lot of awareness in the importance of SWM, especially in the operations of landfills and upgrading of landfills. However the safe closure aspect is still lacking but the Government is actively promoting this matter and will carry out some of the recommendations as set out in the Study reports. It is still not too late to start and the JICA Study is particularly useful to kick-start and to educate the public and the stakeholders on how to design, construct, operate and close a landfill properly.

4. *Mr. Hisashi Yamauchi, JICA Study Team Leader*

Mr. Yamauchi expressed his thanks and gratitude to all the stakeholders for their assistance through out the Study period, especially to MHLG for their support. The Study has identified some key issues that the Malaysian Government will have to consider and implement in order to resolve the problems presently associated with the landfill problems. In general, the Study's Action Plan has recommended 6 Actions that will have to be considered and carried out in the near future, they are;

- Action 1 : To authorise the safe closure guideline
- Action 2 : To implement physical closure and post closure management
- Action 3 : To establish the landfill registration system
- Action 4 : To arrange the Federal and State organisations
- Action 5 : To establish a funding system for safe closure
- Action 6 : To develop human resources for capacity building

5. *Prof. Nie Yongfeng, Professor, Tsinghua University, China.*

Prof. Nie expressed his gratitude to MHLG and to the JICA Study Team for inviting him and the other foreign participants to the seminar. Prof. Nie informed that the problems associated with municipal solid waste are universal and experienced in all the Asian countries. Even in China, where

there is plenty of land for disposal, the constant use of landfills is not the long-term solution and other method of waste treatment is required. This can be achieved by adopting and learn new management skills and technology from the developed nations such as Japan and the Western countries. With the knowledge, then the developing countries can implement the activities and try to solve the MSW problems.

Question No.1. *En. Noor Mohamed Mond Haniba (Worldwide Landfills) to the panel*

En. Noor enquired why the Study did not emphasise more on the CDM in order to receive the funds.

Answer No.1 Mr. Yamauchi explained that the Study did consider the possibility of using the CDM for alternative source for funding the safe closure. However, the Study only recommended it as an alternative as the main funding should have come from the Federal Government and not depends on the CDM funds. The application for CDM funds is fairly complicate and the Study thinks that the process may be difficult and takes too long time to achieve.

Question No.2. *Mr. Peter Ho Yueh Chuen (Perunding Utama Sdn Bhd) to the Panel*

Mr. Ho stated that the key issue lie in the “Ownership” of the landfills and the management responsibilities. At present there are still some confusion pertaining to who should be responsible for some of the closed landfill sites, especially the older one. Although land matters are under the State Government control but are not responsible for the maintenance and monitoring of the sites. With the forthcoming privatisation programme, such “ownership” issues will have to be addressed before privatisation can proceed.

Answer No.2 The Chairman explained that the Ministry is in the process of establish the institutional framework for SWM activities. However the success is highly dependant on the cooperation of the State Government and Local Authorities. Nevertheless, the Ministry, also consideration the recommendations proposed by the JICA Study, will look into the issue carefully.

Question No.3. *Mr. Brian Makepeace (MB Technology (M) Sdn Bhd) to the Panel*

Mr. Makepeace enquired whether the Guideline for the safe closure of landfills is going to be extended to include guidelines for the new landfills. Mr. Makepeace further enquired, with regards to ownership o the sites, who will be responsible to imposed and implement the safe closure of the new landfill sites.

Answer No.3 Mr. Yamauchi explained that before the Study, there were no guidelines for

safe closure. The new draft guideline should be adopted by the Ministry for both the existing and new landfills.

As for the “ownership” issue, the Chairman informed that in the future, when privatisation comes into force, provision will be included into the contract agreement to ensure that the privatised company will be responsible for all operations and closure, and to bare all the necessary cost.

Engku Azman added that in the planning of new landfills, the EIA process will require the owner or operator to include their proposed closure plan before any new landfill can be constructed.

Closing message by Dr. Yasushi Matsufuji, Professor, Fukuoka University, Japan, Advisor to JICA.

Dr. Matsufuji expressed his gratitude to MHLG and to all the participants for making the Seminar a success. Dr. Matsufuji stated that although “money” is the most important factor in the development of SWM, but most importantly we must also consider that “money can not buy environmental spare parts, and don’t forget that we are only borrowing this Earth for our future generations”. We should always consider the environmental quality of what we do and act accordingly.

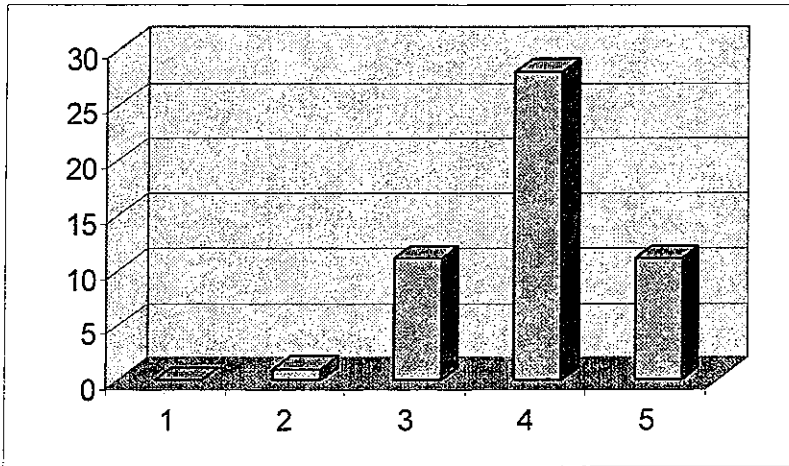
SEMINAR EVALUATION

(9 question/answer)

The participants are requested to assess the Seminar by marking from 1 (poor) to 5 (excellent) the aspects detailed below. The numbers of responses for each score are given for a total of 51 forms returned.

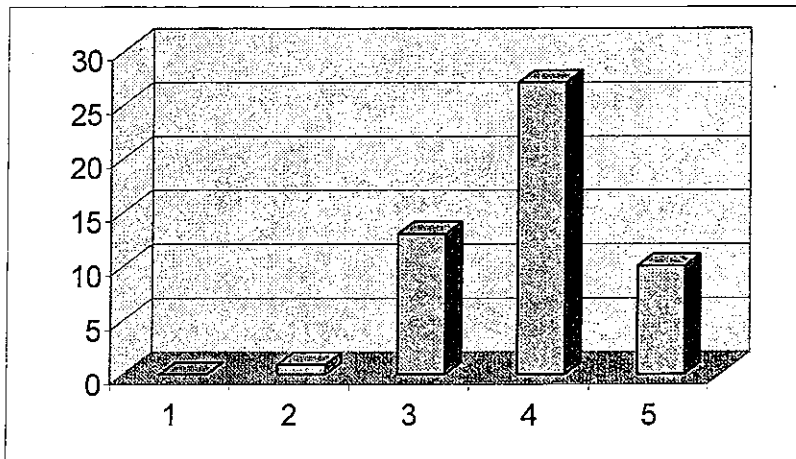
1. To what extent did the Seminar meet your expectations?

1 (poor)	2 ←	3 (average)	→ 4	5 (excellent)
0	1	11	28	11



2. To what extent is this Seminar useful to your activities?

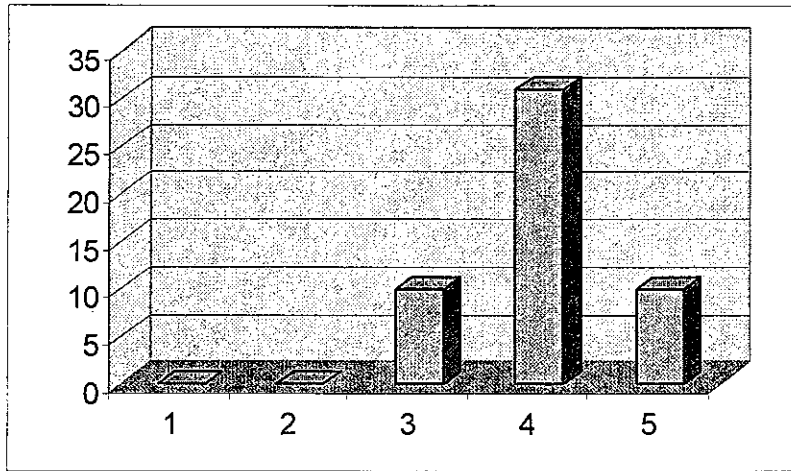
1 (poor)	2 ←	3 (average)	→ 4	5 (excellent)
0	1	13	27	10



3. How do you appreciate the information presented in this Seminar?

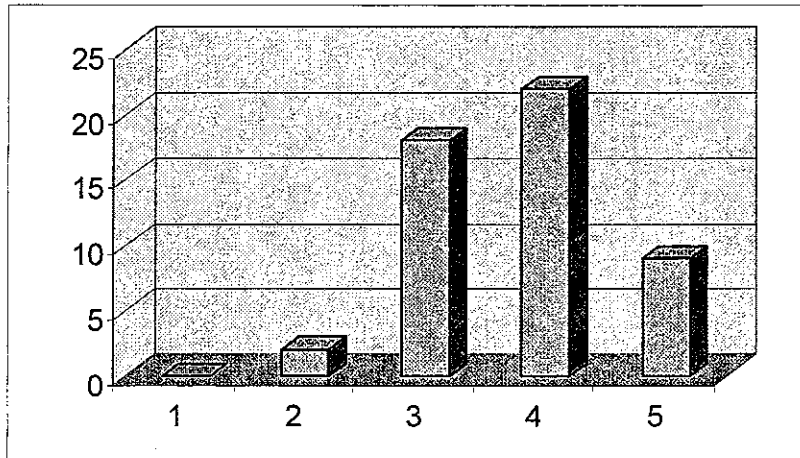
1 (poor)	2 ←	3 (average)	→ 4	5 (excellent)
0	0	10	31	10

2. Second Seminar on The Study on the Safe closure and Rehabilitation of Landfill Sites in Malaysia



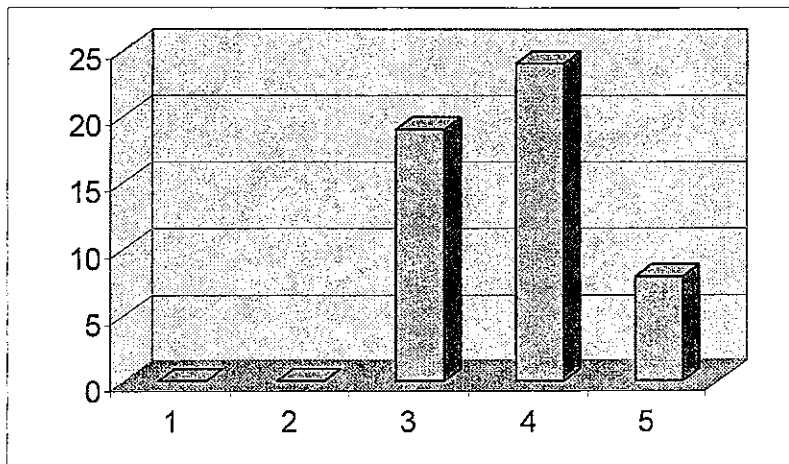
4. How do you appreciate the presentation methods used in this Seminar?

1 (poor)	2 ←	3 (average)	→ 4	5 (excellent)
0	2	18	22	9



5. How do you appreciate the presentation materials and the Seminar support?

1 (poor)	2 ←	3 (average)	→ 4	5 (excellent)
0	0	19	24	8



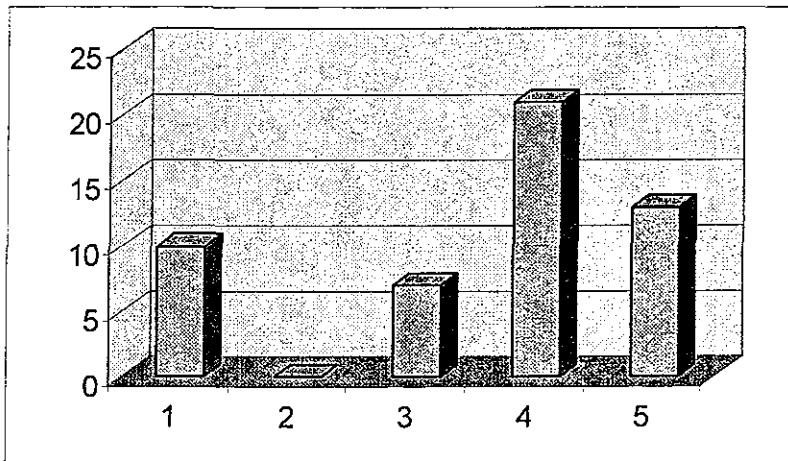
2. Second Seminar on The Study on the Safe closure and Rehabilitation of Landfill Sites in Malaysia

6. Please indicate below any other impressions, comments or suggestions related to this Seminar.

- More variety of examples will be useful, more realistic figures for capital development is useful.
- Will the final report be made available to the participants.
- Must include technical site visit.
- The sequence of the seminar paper should be theoretical followed by practical and then comparison.
- Should highlight more on chemical substances effects to human health.

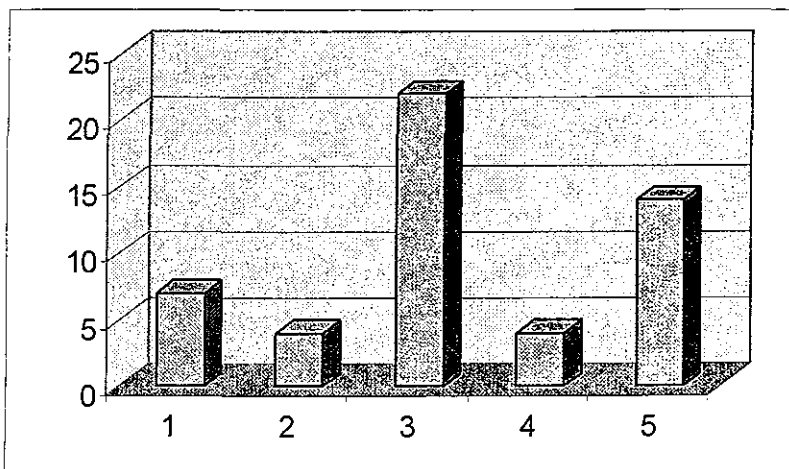
7. Do you intend to implement the Safety Closure & Rehabilitation of the landfill site of your own locality?

No site / No intention	Weak intention	Average	Strongly	Very strongly
10	0	7	21	13



8. What do you feel about the possibility for Safety Closure & Rehabilitation of the landfill site of your own locality within next 5 years?

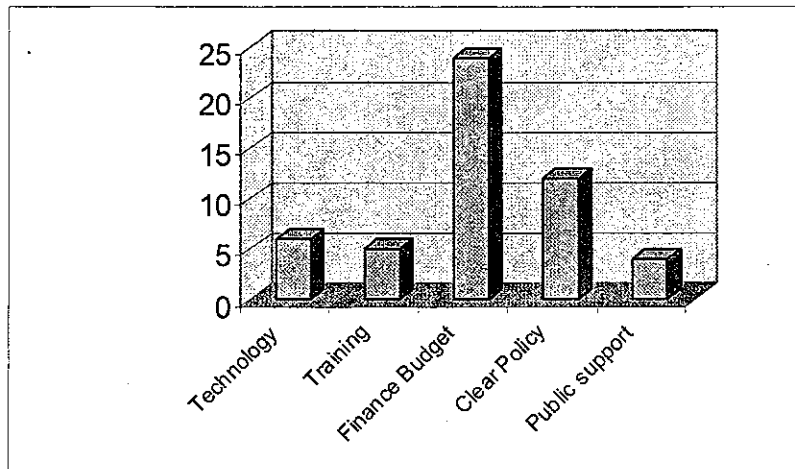
Impossible	Limited chance	Possible	Very likely	Surely
7	4	22	4	14



2. Second Seminar on The Study on the Safe closure and Rehabilitation of Landfill Sites in Malaysia

9. What do you need most to achieve Safety Closure & Rehabilitation of the landfill site of your own locality? Please Prioritise. (1 - least need, 5 - most need)

Technology	Training	Finance Budget	Clear Policy	Public support
6	5	24	12	4



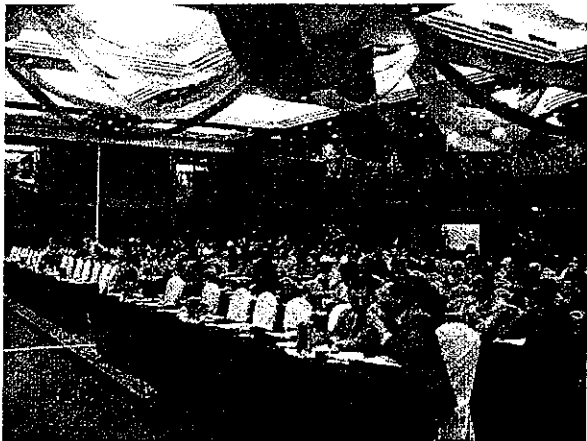
2. Second Seminar on The Study on the Safe closure and Rehabilitation of Landfill Sites in Malaysia



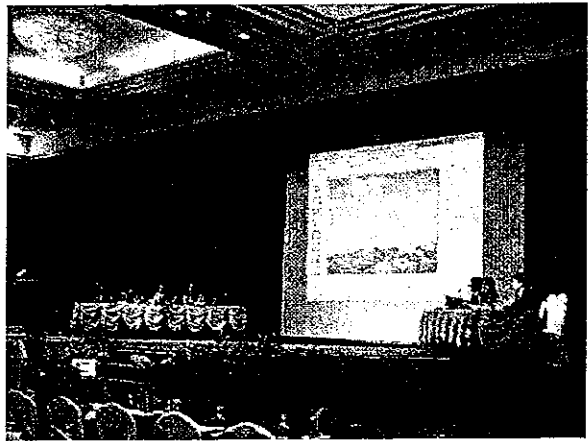
Opening Session



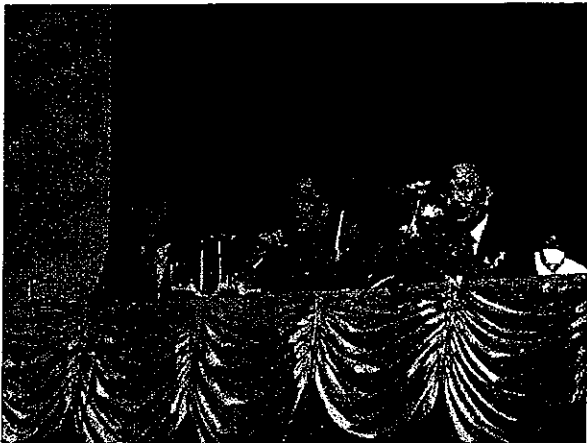
Exchange of token



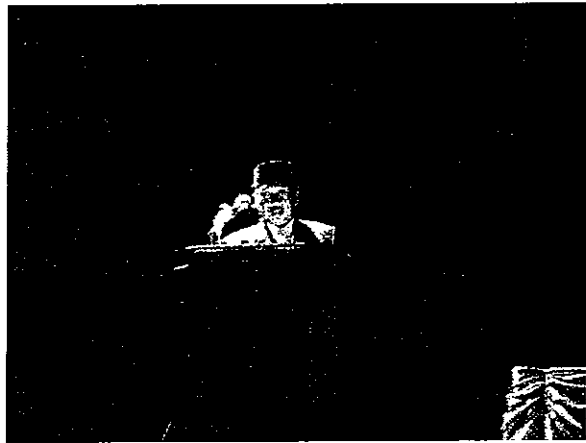
Participants



Panel Discussion I (ASEAN Countries)



Participants from ASEAN Countries



Presentation by MPSP

2. Second Seminar on The Study on the Safe closure and Rehabilitation of Landfill Sites in Malaysia

Day 1: September 28th (Tuesday)

- 08:30 – 09:00 Registration
- 09:00 – 10:00 Opening Ceremony
1. Welcome speech by MHLG
 2. Welcome speech by the Resident Representative, JICA Malaysia Office
 3. Opening address by the Minister of MHLG
- 10:00 – 10:30 Tea Break

SESSION 1 **Chairman: Ir. Fong Tian Yong**

Deputy Director General, Local Government Dept. MHLG

- 10:30 – 11:00 **Necessity of Safe Closure of Landfill Sites in Malaysia**
Prof. Yasushi Matsufuji, Fukuoka University
- 11:00 – 11:30 **Overall Objective and Output of the JICA Study**
Mr. Hisashi Yamauchi, JICA Study Team Leader
- 11:30 – 12:00 **Towards Safe Closure of Landfill Sites in Malaysia**
*En. Mohd Nazeri Bin Salleh, Principal Assistant Director,
Project Implementation Unit, MHLG*
- 12:00 – 12:30 Questions & Answers Session
- 12:30 – 14:00 Lunch Break

SESSION 2 **Chairman: Y.M. Engku Azman Bin Tuan Mat**

Director, Project Implementation Unit, MHLG

- 14:00 – 14:40 **Guideline and Action Plan for Safe Closure of Landfill Sites**
Mr. Hiroshi Abe, JICA Study Team Member
- 14:40 – 15:00 Questions & Answers Session
- 15:00 – 15:30 Tea Break

SESSION 3 **Chairman: Mr. Hisashi Yamauchi**
JICA Study Team Leader

- 15:30 – 17:00 **Panel Discussion:**
Issues and Future Solid Waste Disposal Plan in Neighbouring Countries
Panellists:
Representatives from China, Indonesia, Myanmar, Nepal, Philippines, Thailand, Vietnam and Bangladesh (8 countries)

Day 2: September 29th (Wednesday)

SESSION 4 **Chairman: Y.Bhg Datuk Ir. Dr. M.S. Pillay**

Director, Engineering Services Division, Ministry of Health

- 09:00 – 09:40 **Safe Closure of Landfill in Malaysia – Academic Viewpoint**
Dr. Nasir Bin Hassan, University Putra Malaysia (UPM)
- 09:40 – 10:40 **Practice on Safe Closure of Landfill : An Experience of a Local Authority**
Dr. Hj. Romli Bin Hj. Awang, Majlis Perbandaran Seberang Perai
- 10:40 – 11:10 Questions & Answers Session
- 11:10 – 11:30 Tea Break

2. Second Seminar on The Study on the Safe closure and Rehabilitation of Landfill Sites in Malaysia

SESSION 5

Chairman: En. Huszian Bin Husin

Director, Environmental Health Engineering Division, MHLG

11:30 – 12:10 **Physical Closure and Post Closure Management of Landfill Site**
Mr. Kohshi Takahata, JICA Study Team Member

12:10 – 12:40 **Evaluation of Pilot Project**
Mr. Munehiro Fukuda, JICA Study Team Member

12:40 – 13:10 Questions & Answers Session

13:10 – 14:30 Lunch Break

SESSION 6

Chairman: Dato' Mohamad Bin Saib

Director General, Local Government Dept. MHLG

14:30 – 15:30 **Panel Discussion:**
Issues Towards Safe Closure of Landfill in Malaysia
Panellist:
EPU, MOH, DOE, Prof. Yasushi Matsufuji, Mr. Hisashi Yamauchi

15:30 – 16:00 **Closing Address**
Dato' Mohamad Bin Saib, Director General, Local Government Dept. MHLG

16:00 – 16:30 Tea Break

The Study on the Safe Closure and Rehabilitation of Landfill Sites in Malaysia

Record of the First Training Workshop on January 19th & 20th 2004

<1st Day Sessions>

1. Opening Speech

The First Training Workshop was opened by Dato'Haji Ismail Bin Mamat, President of Majlis Perbandaran Seberang Perai (MPSP). In his opening speech he welcomed the participants to Training Workshop and thanked the Ministry of Housing and Local Government and JICA for inviting him and the opportunity to have the workshop in Seberang Perai. Dato' Haji Ismail also thanked JICA for their assistance in managing the Ampang Jajar Sanitary Landfill for the last ten years and also to assist in the safety closure of the landfill. Dato' Haji Ismail also talked about the importance of the JICA study on the safety closure and rehabilitation of landfill sites in Malaysia. The study will eventually produce the necessary guideline and suitable methods for safety closure.

2. Outline of the JICA Study and Workshop Objectives/ Contents

The opening speech was followed by a brief introduction by The JICA Study Team Leader, Mr. Hisashi Yamauchi, who expressed his thanks on behalf of JICA to Dato' Haji Ismail, MHLG and to MPSP for the opportunity to hold the workshop.

Mr. Yamauchi then presented the outline and background of the study. In his speech, he informed that the main purpose of the Training Workshop is for the capacity building of the officials from the Federal Government of Malaysia, the State Government and from the Local Authorities, especially focusing on the State Government since they are the main players for the management of landfill sites safety closure. Mr. Yamauchi also expressed his hope that there will be close discussions between the participants and the JICA Study Team members.

Mr. Yamauchi finished by explaining the program of the First Training Workshop to be carried out within the 2 days sessions.

3. Self Introduction of the Participants

Following the tea break, the session started with the self-introduction of the participants. The list of participants is attached herewith.

4. Coursework 1

The Coursework 1, on the landfill site closure priority and closure levels determinations was presented by Mr. Munehiro Fukuda, JICA Study Team Member. The coursework notes are provided to the participants.

During his explanation, Mr. Fukuda informed that during the last seminar held in September 2003, a question concerning why the waste quantity was not included as one of the determination parameters. He replied by stating that the actual quantity of waste is most often difficult to determine as most sites do not have weighing facilities, hence the quantities can only be estimated by the area and height of the landfilled waste.

5. O&A for coursework 1

The first question was raised by Mr. Mahmoud Riad, JICA Study Team Member. Mr. Riad asked whether the level of landfill facility and the waste cover should be considered separately. Mr. Fukuda explained that in some cases both issues may be overlapped and other times separated.

The next question was raised by Mr. Kazal Sinha, MOH, who enquired why the weightage for the landslide impact is set at 5, a rather high value considering the fact that is the landfill is far from residential areas, landslides may not have a such a high impact. In replying, Mr. Fukuda explained the landslide may not have a direct environmental impact but more of a safety issue as it may be dangerous to the workers present at the sites.

Further to that, Mr. Kazal Sinha also enquired why the leachate “quantity” parameter is preferred rather than adopting the leachate “quality” since the latter is a more important parameter to consider. Mr. Fukuda explained that the determination process was carried out based on available information and feedbacks from the questionnaire sent to the Local Authorities. The leachate quality is difficult to ascertain and requires sampling and laboratory analysis. In most cases the LAs do not have such data and thus due to such constraints, it was decided to adopt the “quantity” parameter instead of the “quality” parameter.

Mr. M.Raju, MPSP, raised the question on whether the rainwater management is addressed as an issue since it may affect the quantity of leachate produced. Mr. Fukuda explained this issue is raised in the landfill facility parameter under rainwater drainage system.

Mr. Kazal Sinha also raised the question on how to provide liner systems for existing landfill sites. Mr. Fukuda explained that for such cases, only vertical liners may be considered.

6. Coursework 2

The Coursework 2, on the landfill site registration system was presented by Mr. Hiroshi Abe, JICA Study Team Member. The coursework notes are also provided to the participants.

Mr. Abe explained that all participants are requested to fill the landfill questionnaire base on information on Ampang Jajar as a sample coursework to determine the closure priority and landfill closure levels.

7. O&A for coursework 2

The first question was raised by Mr. Kazal Sinha, MOH, enquiring that how the questionnaire should be filled in since majority of the participants present will not have access to specific details of the landfill sites. Mr. Abe explained that in this training workshop, the main purpose is to raise the awareness of the state representatives so that they can instruct their relevant responsible personnel in their respective LAs to provide the necessary information.

Mr. Fukuda added that the purpose of the coursework exercise is to show to the participants how the landfill closure priority and levels are determined so that they are aware of the computation methods.

With regard to the proposed institutional setup flowchart, Puan Sharifah Norulashikah bte Syed Mohamed, Kedah State Secretary, enquired whether the flowchart is proposed by the JICA Study Team or is it adopted by MHLG. Mr. Abe explained that it is a proposal by the JICA Study Team and already submitted to the Technical Working Group for their comments. Further to that, Mr. Koh, MHLG, added that MHLG have received the proposed framework and they will consider the proposal and will comments accordingly.

Mr. Kazal also enquired whether the proposed institutional framework has taken into account of the anticipated privatisation of the waste disposal system as proposed by the Federal Government. Mr. Abe explained even though the privatisation may take place, it is the responsibility of the Government to ensure that the proper management of the safety closures are being carried out, whether by the LAs or by private landfill operators. No matter what happens, the owner of the landfills will still be responsible for registration of the land, operations and proper safety closure.

8. Coursework 3

The coursework 3 on the supplementary explanation of physical closure and post closure management was presented by Mr. Mahmoud Riad, JICA Study Team Member. The coursework notes are also provided.

9. Q&A for coursework 3

The first question was raised by En. Kamaruddin, MPSP, enquiring who will fund the necessary cost of safety closure of landfill sites in Malaysia. Mr. Riad explained that the funding will be either as subsidy from the Federal Government or from the tipping fee charged for the disposal at the landfills. This proposed funding system prepared by the JICA Study Team has already submitted to the TWG for their comment.

10. Visit to Ampang Jajar Sanitary Landfill Site

A visit to the Ampang Jajar Sanitary Site by all the participants was arranged by MPSP. During the visit, a brief explanation of the available facilities was presented by members of the JICA Study Team, together with the description of the Pilot Project Work being carried out.

Also during the visit, the coursework exercise on how to fill in the questionnaire was explained by En Zainuddin Arshad, JICA Study Team Member, by using the Ampang Jajar Sanitary Landfill Site as the example.

The site visit was followed by a briefing by En Ismail on the new transfer station to replace the present landfill as the Ampang Jajar sanitary landfill has reached it target lifespan and ready for closure. En. Ismail informed that transfer station has just been commissioned and at present the transfer station handles about 300 to 350 tonnes of waste per day. The tipping fee is charged at RM27 per tonne and haulage fee at Plau Burung landfill site is charged at about RM40 per tonne.

<2nd Day Sessions>

The second day session started with the participants assigned to the respective groupings for discussion and suggestions. The topic of discussion for Activity 1 is on the Priority and Closure Level, and Activity 2 is on the Landfill Registration.

The participants for the 2 Groups were as follows;

Group 1

Pn Salwani Bt. Ismail, EPU
Mr. Khew Swee Lian, MOH
En. Ahmad Suaidi Bin Abd Rahim, SUK Selangor
En. Abdul Wahab Bin Jaafar, MPSP
Mr. Koh Chee Yong, MHLG
Mr. Munehiro Fukuda, JICA Team Member
En. Zainuddin Bin Arshad, JICA Local Engineer

Group 2

En. Morshidi Bin Ahmad, Ministry of Environment and Public Health, Sarawak
Pn Sharifah Norulashikah Bt Syed Mohamed, SUK Kedah
En. Omar Bin Jamil, MPSP
En. Mohd Zaki Bin Othman, MHLG
Mr. Hiroshi Abe, JICA Team Member
Mr. Mahmoud Riad, JICA Team Member
Mr. Ng Han Kok, JICA Local Engineer

11. Group Findings and Comments from the Discussion Groups

The discussion sessions ended with the presentation of the group findings and comments. The comments were as follows;

Coursework 1: Comments on Prioritisation & Closure Level Determination

The comments from Group 1 were as follows:-

- 1) The water intake points, what is the recommended distance from the landfill to consider.
- 2) Post closure land use, the conditions should be recommended, i.e. how many years to wait before development can proceed.
- 3) Questionnaire shall be filled by the proper person(s).
- 4) The Local Authorities commitment to be evaluated, i.e. what have they implemented and the steps taken.
- 5) The definitions on the daily waste cover and daily operation should be clearly explained as they are not similar.
- 6) Some of the closure levels as presented in the Action Plan are not the same as those computed by the participants. The Action Plan figures shall be reviewed.

The comments from Group 2 were as follows:-

- 1) In the questionnaire, the choices for land ownership question should be broken down into Federal, State or Local Authorities.
- 2) Estimation for waste quantities shall be accompanied by the method of estimation.
- 3) The term “wild” animals should be changed to “stray” and include cows and birds.
- 4) The term “odour”, “smoke” and “gas” should be broken down and addressed separately.
- 5) The questionnaire only requested for leachate quantity and not leachate quality. For example, in the case of Ampang Jajar the leachate is treated to Standard B, which is within DOE’s approved limits. Information on leachate quality, when available should be submitted.
- 6) In the questionnaire, under item C1, an additional option must be provided for “in operation”, since the landfill may still be in operation.
- 7) Under item C2, the term “Surrounding” should be defined clearly, i.e. does it include the area within the fence or the area outside the gazetted area.
- 8) Under item C6, the term “town centre” must be clearly defined.
- 9) The social issue concerning scavengers was not considered in the questionnaire and should have been included.
- 10) The issue concerning the controlled access must also be addressed, i.e. fencing or hoarding to prevent stray animals from entering the site.
- 11) Post closure land use, the recommended conditions taken into consideration is to wait at about 10 years before development can proceed.

Coursework 2: Comments on Landfill Registration

The comments from Group 1 were as follows:-

- 1) It is recommended that a Committee comprising representatives from related organs of State Government should replace the proposed LSMD.
- 2) The proposed task of State Government to monitor the landfill matter is not appropriate, should have been the task of the Local Authorities.
- 3) Funding must be from the Federal Funds or from collection tariffs, because financial capacity of states/ LAs is limited.
- 4) Regional zones should be set up representing the Northern, Central and Southern region.
- 5) The recommended format for the registration system prepared by the Study was considered appropriately.
- 6) The Capacity Building must also include the participation of local bodies such as the NGOs and the local communities.
- 7) The Federal and State Governments must continue in gathering the landfill information and update the database.

The comments from Group 2 were as follows:-

- 1) The group members recommended that DOE’s involvement should be increased in order to have same regulatory balance.
- 2) The Local Authorities should monitor and inspect the safety closure activities whilst the State Government should compile and keep the data and information of the monitoring

3. First Training Workshop on The Study on the Safe closure and Rehabilitation of Landfill Sites in Malaysia

works.

- 3) The participant from Sarawak explained the procedures as adopted by Sarawak and the important role played by NERB in the process.

12. Workshop closing

The First Training Workshop was closed by Mr. Yamauchi by summarizing the above comments and recommendations.

Attendance List of the 1st Training Workshop

(19-20 January 2004, Seberang Perai)

<Malaysian Side>

En. Koh Chee Yong	Ministry of Housing and Local Government
En. Mohd Zaki bin Othaman	Ministry of Housing and Local Government
Pn. Salwani Binti Ismail	Economic Planning Unit
Ir. Kazal Sinha	Ministry of Health
En. Khew Swee Lian	Ministry of Health
En. Omar Bin Mohamed Zain	Department of Environment
Pn Sharifah Norulasyikhah Bt. Syed Mohamad	Kedah State Secretary Office
En. Ahmad Suaidi bin Abd. Rahim	Selangor State Secretary Office
En. Morshidi bin Ahmad	Ministry of Environment and Public Health of Sarawak
Pn. Sapiah binti Haron	Melaka City Council
Dr. Romli	Seberang Perai Municipal Council
En. Kamaruddin	Seberang Perai Municipal Council
En. Omar Jamil	Seberang Perai Municipal Council
En. Abdul Wahab Jaafar	Seberang Perai Municipal Council
Mr. Raju	Seberang Perai Municipal Council
En. Mat Seman Mohd. Nor	Kota Bahru Municipal Council
En. Abdul Razak bin Ismail	Kota Bahru Municipal Council

<JICA Study Team>

Mr. Hisashi Yamauchi	Team Leader/ Solid Waste Management Plan
Mr. Hiroshi Abe	Sanitary Landfill
Mr. Mahmoud Riad	Facility Design/Cost Estimation/Construction Supervision
Mr. Munehiro Fukuda	Environmental Consideration/Environmental Monitoring

<JICA Officer>

Mr. Hitoshi Ara	Assistant Resident Representative, JICA Malaysia Office
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<Local Staff of the JICA Study Team>

Mr. Zainuddin Arshad, A.M.N.	Local Engineer of the JICA Study Team
Mr. Ng Han Kok	Local Engineer of the JICA Study Team
Ms. Nor Fariza Hussein	Local Staff of the JICA Study Team

<Press>

Mr. Takafumi Yoshida	The Asahi Shimbun
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3. First Training Workshop on The Study on the Safe closure and Rehabilitation of Landfill Sites in Malaysia



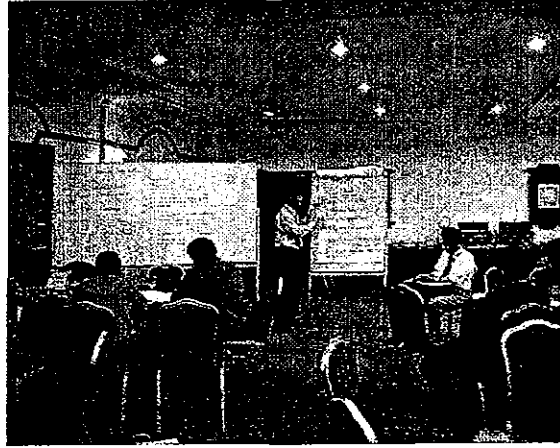
Opening Speech



Group Discussion



Group Discussion



Group Findings Presentation



Site Visit (Ampang Jajar)



Site Visit (Ampang Jajar)

The Study on the Safety Closure and Rehabilitation of Landfill Sites in Malaysia

Program of the 1st Training Workshop

1st Day (19 January 2004)

8:30 - 9:00	Registration
9:00 - 9:30	Opening Speech by Dato' Hj. Ismail B. Mamat, President of MP Seberang Perai
9:30 - 9:50	Outline of the JICA Study, Workshop Objective and Content: Mr. H. Yamauchi, JICA Team Leader
9:50 - 10:00	Tea break
10:00 - 10:15	Self-Introduction of Participants
10:15 - 11:00	Coursework 1: Landfill Sites Priority and Closure Levels Determination: Mr. M. Fukuda, JICA Team Member
11:00 - 11:45	Coursework 2: Landfill Sites Registration System: Mr. H. Abe, JICA Team Member
11:45 - 12:15	Supplementary Explanation of Physical Closure (PC) and Post Closure Management (PCM): Mr. M. Riad, JICA Team Member
12:15 - 13:00	Preparation of Group members, Distribution of homework, Showing video of Ampang Jajar pilot project: Mr. Koh C.Y. (MHLG) and Mr. Zainuddin A. (JICA Team member)
13:00 - 14:00	Lunch
14:00 - 16:00	Visit to Ampang Jajar Pilot Project Site. Explanation by JICA team members
20:00 -	Dinner at

2nd Day (20 January 2004)

9:00 - 12:00	<p>Each group commence their respective works (discussion, preparation, recommendations)</p> <p><Activity 1> Priority and Closure Level (Group leader to be selected from Counterpart Team; group facilitator: Mr. M. Fukuda, Mr. M. Riad, Mr. Ng Han K.)</p> <p>Participants to review the process for determination of priority and closure levels for landfills. Data base shall then be prepared for Ampang Jajar and other sites. Main purpose of the Activity 1 is to understand the procedure for determination of priority and closure levels of landfill sites. Output of Activity 1 will be to set the priority and closure level for the sites.</p> <p><Activity 2> Landfill Registration (Group leader to be selected from Counterpart Team; group facilitator: Mr. H. Abe, Mr. Zainuddin A.)</p>
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3. First Training Workshop on The Study on the Safe closure and Rehabilitation of Landfill Sites in Malaysia

	Participants to identify issues and recommendations on the registration system of landfill sites that should be adopted by the states that would include information necessary to be registered for land development and transactions, particular information relevant to landfills, relationship with other institutional systems on land, etc. Output of Activity 2 will include listing of the information to be included in the registration, development of the institutional set-up of the registration system, implications on development plans, etc. Landfill information provided by the participants will be "registered" as recommended by the Group in order to test the proposed registration system.
12:30 – 13:40	Group findings presentation and discussions, Chaired by Mr. Koh, MHLG and Mr. Yamauchi, JICA Team leader
13:40 – 14:00	Workshop Recommendations and Conclusion, Chaired by Mr. Yamauchi