

4.2 Workshops

4.2.1 First Workshop

THE STUDY ON SOLID WASTE MANAGEMENT PLAN FOR ULAANBAATAR CITY IN MONGOLIA

REPORT OF FIRST WORKSHOP

December 2004

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1 Introduction

The First Workshop was held as scheduled in the Inception Report, on the mornings of Thursday 9th and Friday 10th December 2004; and it followed the outline of the Workshop presented in the Inception Report. Following discussion within the Municipality and with the Consultants Mr. Badam Delgerbayar, Officer in the City Public Services Department, arranged for 50 people to be invited from a broad spectrum of interested parties including Ministries, Municipality and District Offices, waste collection companies and NGOs.

Appendix 1 Presents the list of invitees. The venue was the Ulaanbaatar Hotel.

Appendix 2 presents the Workshop Program.

The first day of the Workshop was attended by several representatives from JICA and advisers to JICA:

- Mr. Yoshio Kanzaki, JICA Resident Representative in Mongolia
- Mr. Ota Masaaki, JICA Assistant Resident Representative in Mongolia
- Ms Alгаа Saikhanтyа, JICA Program Officer in Mongolia
- Prof. Hidetoshi Kitawaki, Leader of the JICA Advisory Committee, Dean, Graduate School of Regional Development Studies, Toyo University
- Mr. Nagase Yutaka, Advisory Committee Member, Chief, Waste Water Management Section, Public Waste Management Department, Environmental Affairs Bureau, City of Sapporo
- Mr. Murata Takuya, Environmental Management Team II, Group II (Environmental Management), Global Environment Department, JICA Headquarters.

Appendix 3 presents the opening addresses made by Mr. G. Munkhbayar, General Manager of the City Governor's Office, on behalf of the Municipality and by Mr. Yoshio Kanzaki, JICA Resident Representative in Mongolia, on behalf of JICA.

Following the opening addresses the JICA study Team Leader Mr. Susumu Shimura made a PowerPoint presentation giving an introduction and overview of the study. Introductory material was also included in the workshop folder given to all participants.

2 Objectives and Approach

The objectives of the Workshop were to:

- share experience and problems;
- increase awareness of and links to problems elsewhere in the sector; and
- begin to build consensus through co-operation in improving Solid Waste Management in Ulaanbaatar.

The approach to the Workshop was established by Team Member Ms Keiko Kani and was based on the Project Cycle Management and Logical Framework methods, adapted to the Workshop situation. The three principal stages of the process were a progression from (a) assessment of sector performance and identification of key problems (Program Day 1 item 4), through (b) analysis of the causes and effects of these key problems (Program Day 1 item 5) to (c) development of actions required to overcome the problems (Program Day 2 item 3). A further important stage was the opportunity of

participants to express their views, as representatives and citizens, on their future role in solid waste management and on any advice they had for the Study (Program Day 2 item 4).

Most of the work of the Workshop was undertaken within Groups. Participants were divided into four Groups (membership indicated in Appendix 1). Group composition was deliberately mixed so that members were forced to relate to colleagues with different points of view rather than being trapped in the mindsets of their own organizations.

3 Assessment of Sector Performance and Identification of Key Problems

The first Group task was a listing of the important problems in the sector with an indication of the key problems. There was of course considerable overlap between the Groups, which helped in identifying the most important problems. Appendix 4. lists the identified problems. From these four key problems, which were important but not necessarily the four most important in the sector, were selected for further consideration. These were:

- solid waste in Ger area streets;
- illegal dumping causing environmental pollution;
- inadequate solid waste collection and transport systems; and
- inadequate final disposal site.

4 Analysis of the Causes and Effects of Key Problems

Figure 1 presents a "Tree" diagram tracing some of the causes and effects of solid waste in Ger areas. This was prepared by the Consultants in advance of the Workshop as a simple example of how to present the analysis of causes and effects for the selected key problems. Coincidentally it corresponded to one of the key problems identified at the Workshop. Working up from the "roots" of the problem it identifies deficiencies in sector outputs which lead to the problem and the consequences and national impacts which result. Figures 2, 3, 4 and 5 present the cause / effect diagrams produced by the four Groups. Each Group presented its results to the Workshop as a whole.

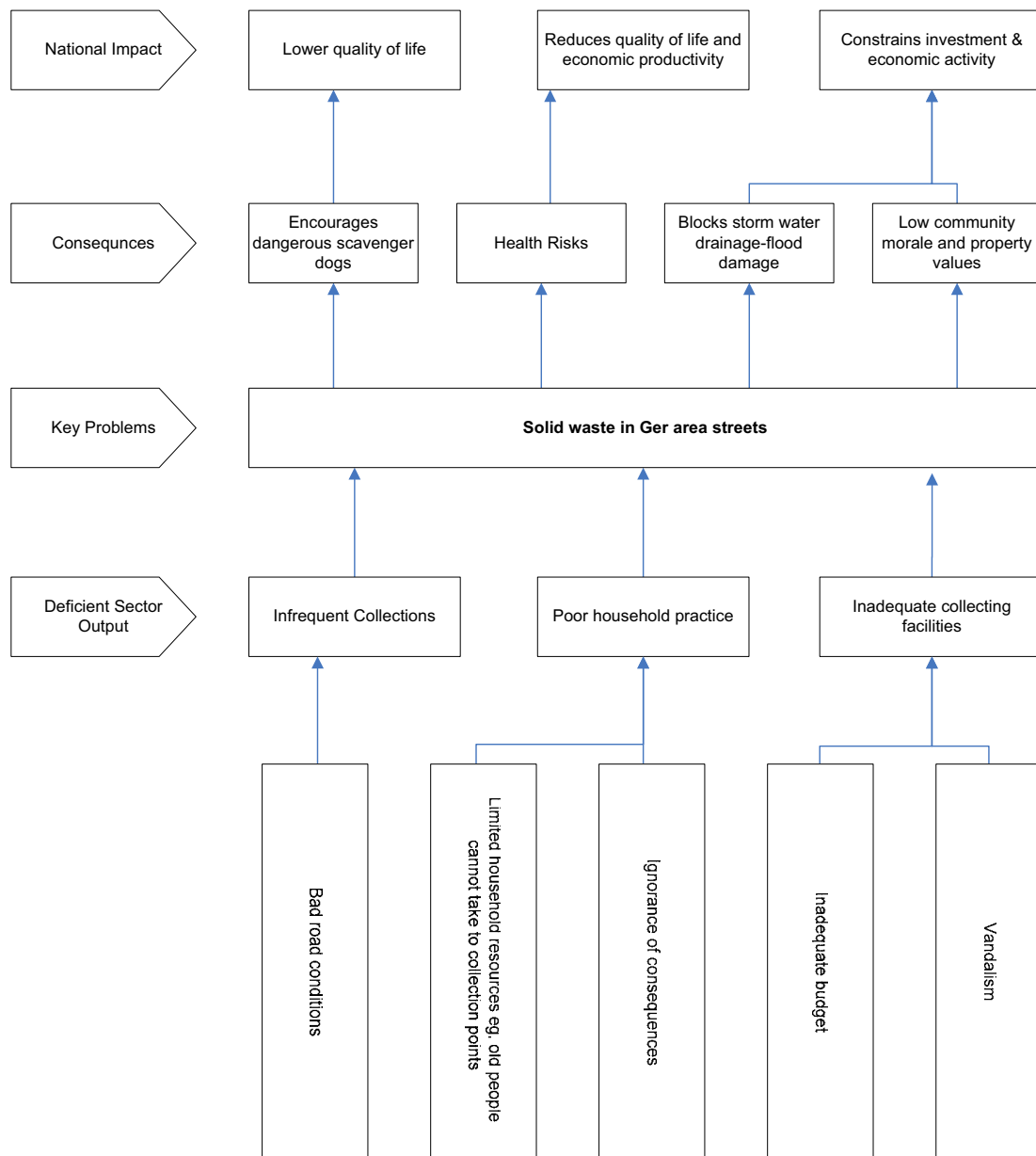


Figure 1: Example of Cause / Effect "Tree" Diagram

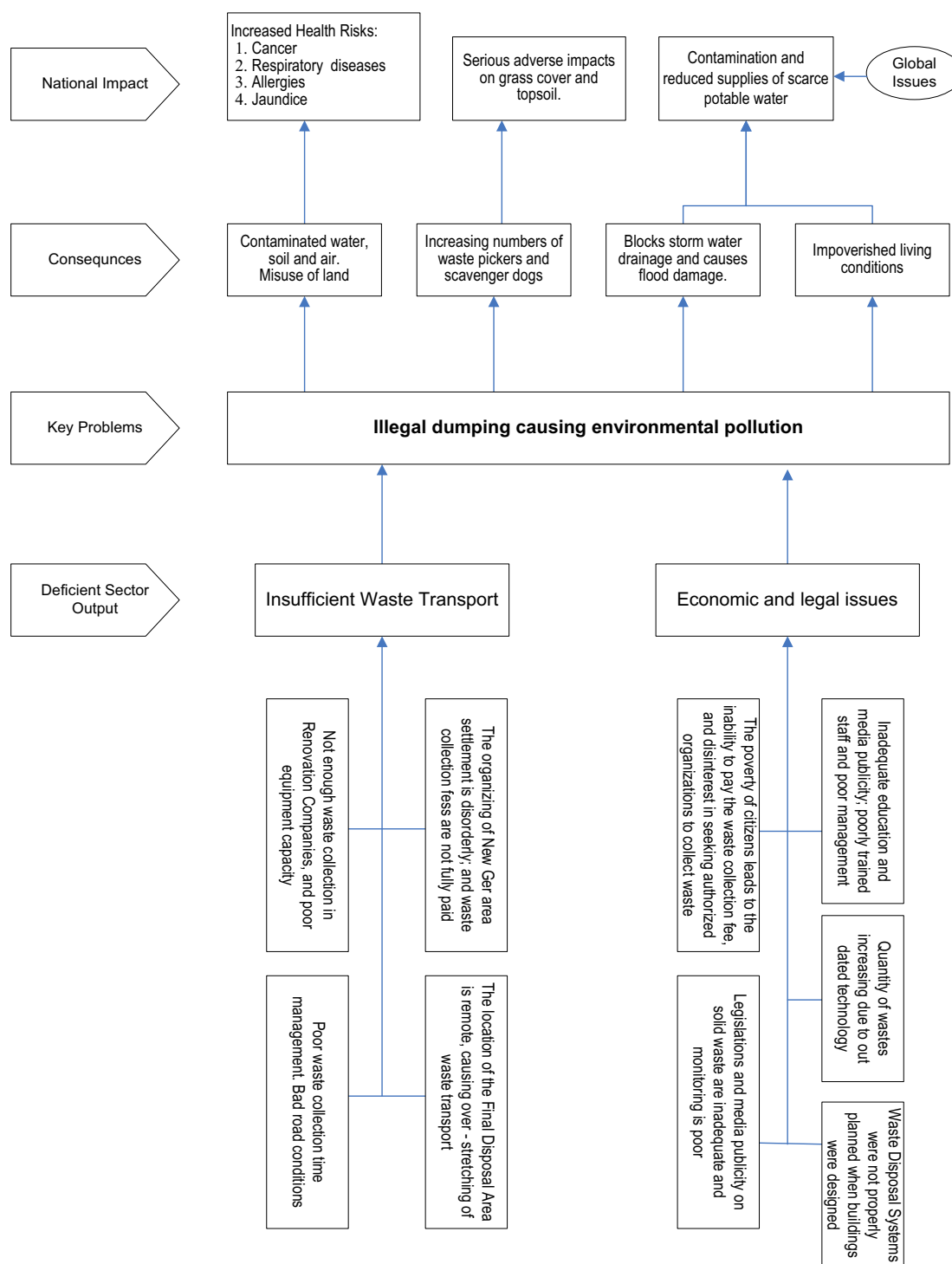
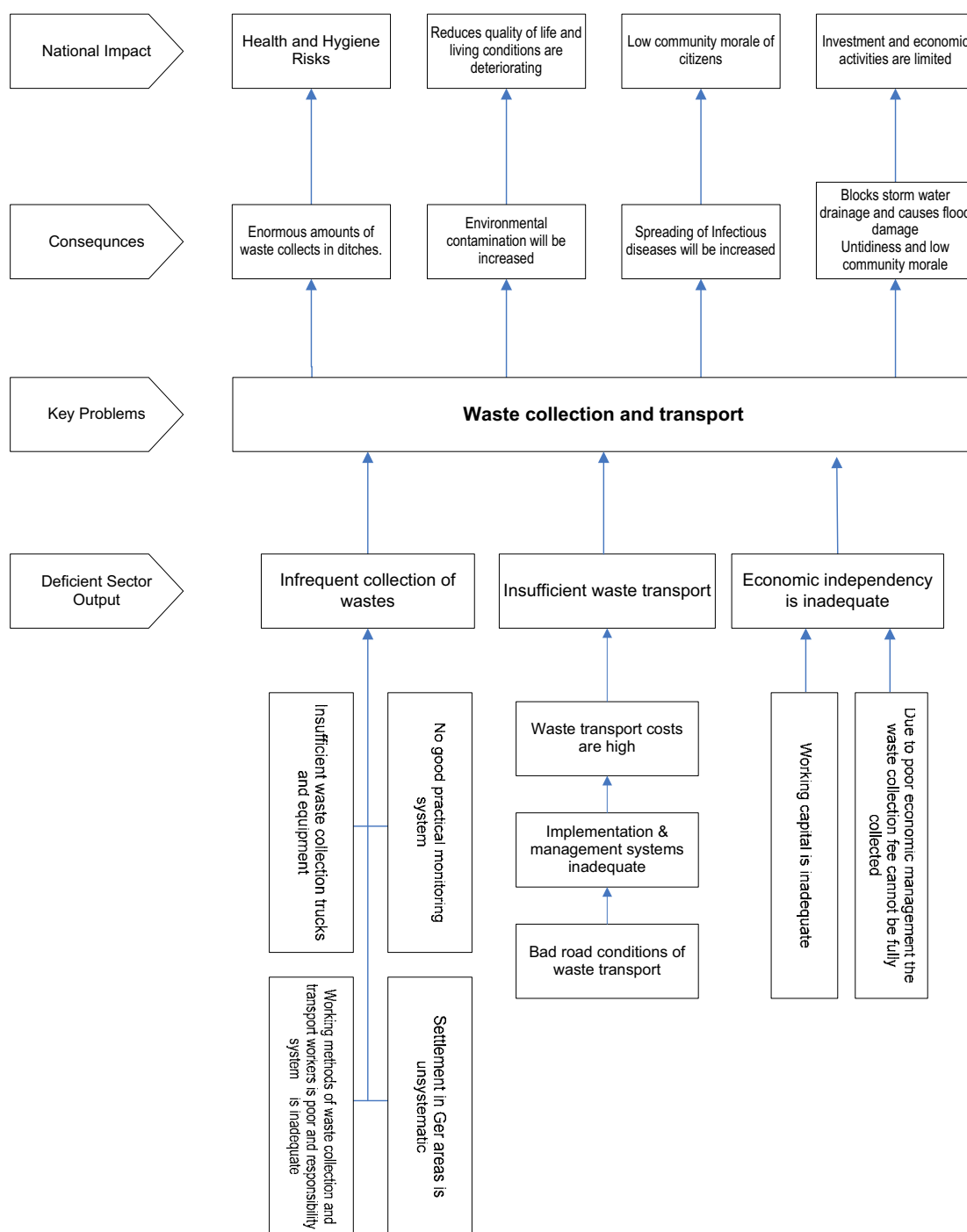


Figure 2: Illegal Dumping Causing Environmental Pollution- Cause/Effect "Tree" (Group A)



**Figure 3: Waste Collection and Transport
Cause and Effect “Tree” (Group B)**

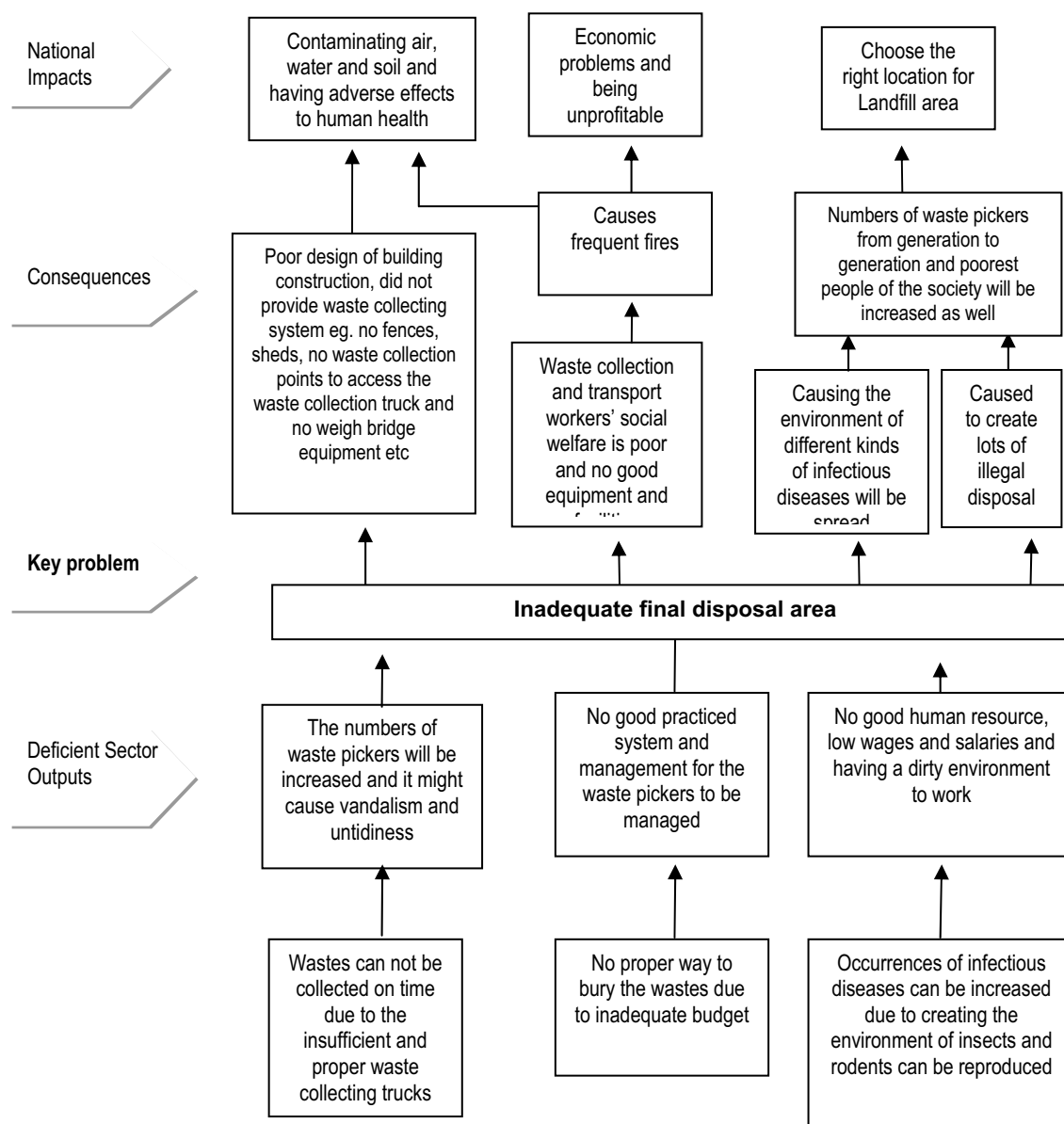
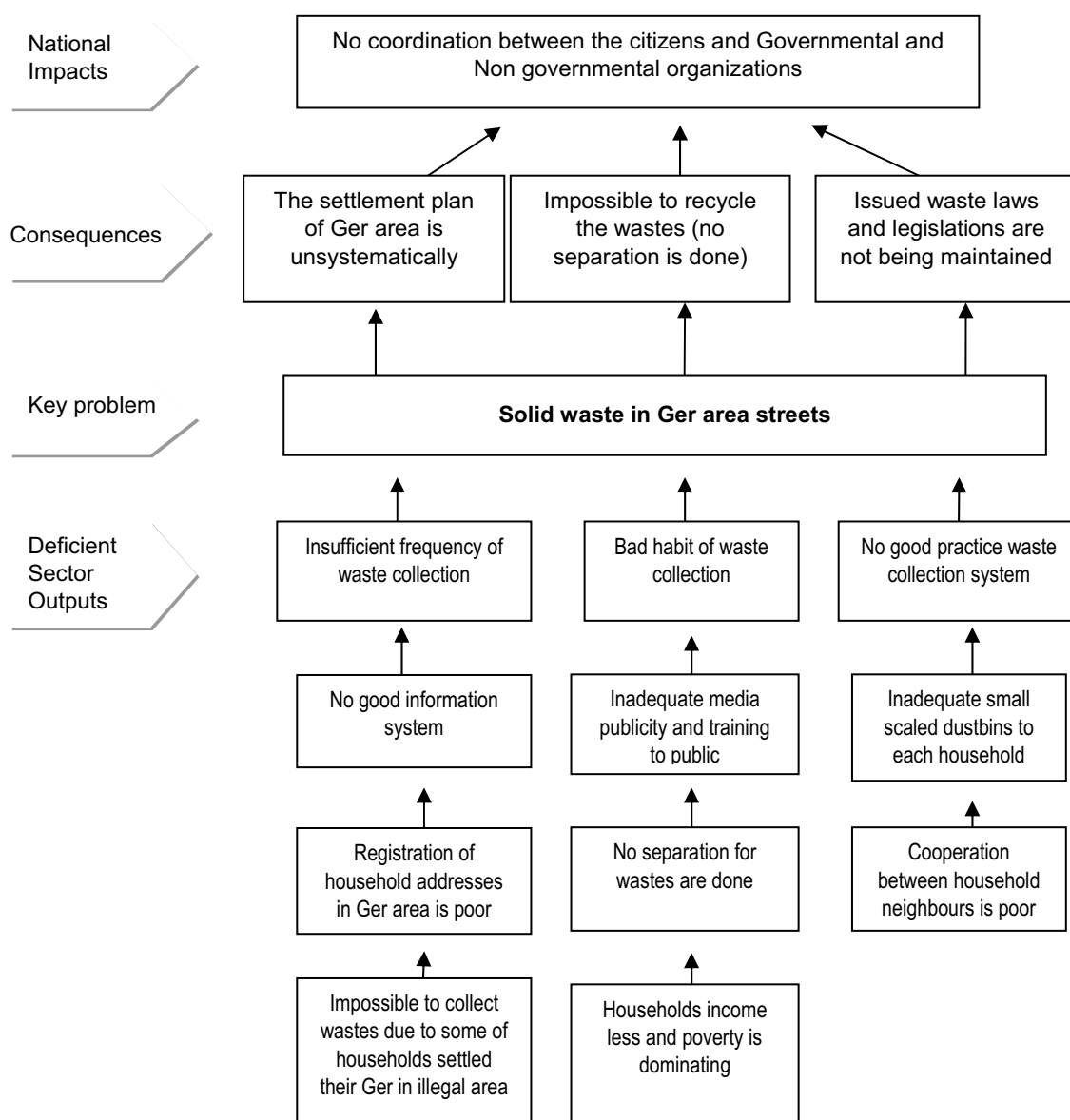


Figure 4: Set up "Landfill area"-
Cause/Effect "Tree" (Group C)



**Figure 5: Solid Waste in Ger area streets
Cause/Effect "Tree" (Group D)**

5 Development of Actions Required to Overcome the Key Problems

The next stage in the Workshop process was to convert the key problems into objectives to be met; and to identify, in as much detail as possible, the actions required to achieve the objectives and the expected effects of the actions. Actions might be of an institutional, policy, legal, financial or other kind; and participants were requested to be as precise as possible. It was explained that there were many alternative possible sets of actions, and that the advice from the Groups would be important input into the Management Plan Study.

Figure 6 presents an Objective "Tree" diagram converting the Consultants' example cause / effect diagram from a key problem to an objective and identifying indicative sector inputs, policy and institutional actions and their effects in terms of consequences and national impacts. This was prepared by the Consultants in advance of the Workshop as a simple example of how to present the objectives and actions for the selected key problems. Figures 7, 8, 9 and 10 present the objective "Tree" diagrams produced by the four Groups. Each Group presented its results to the Workshop as a whole.

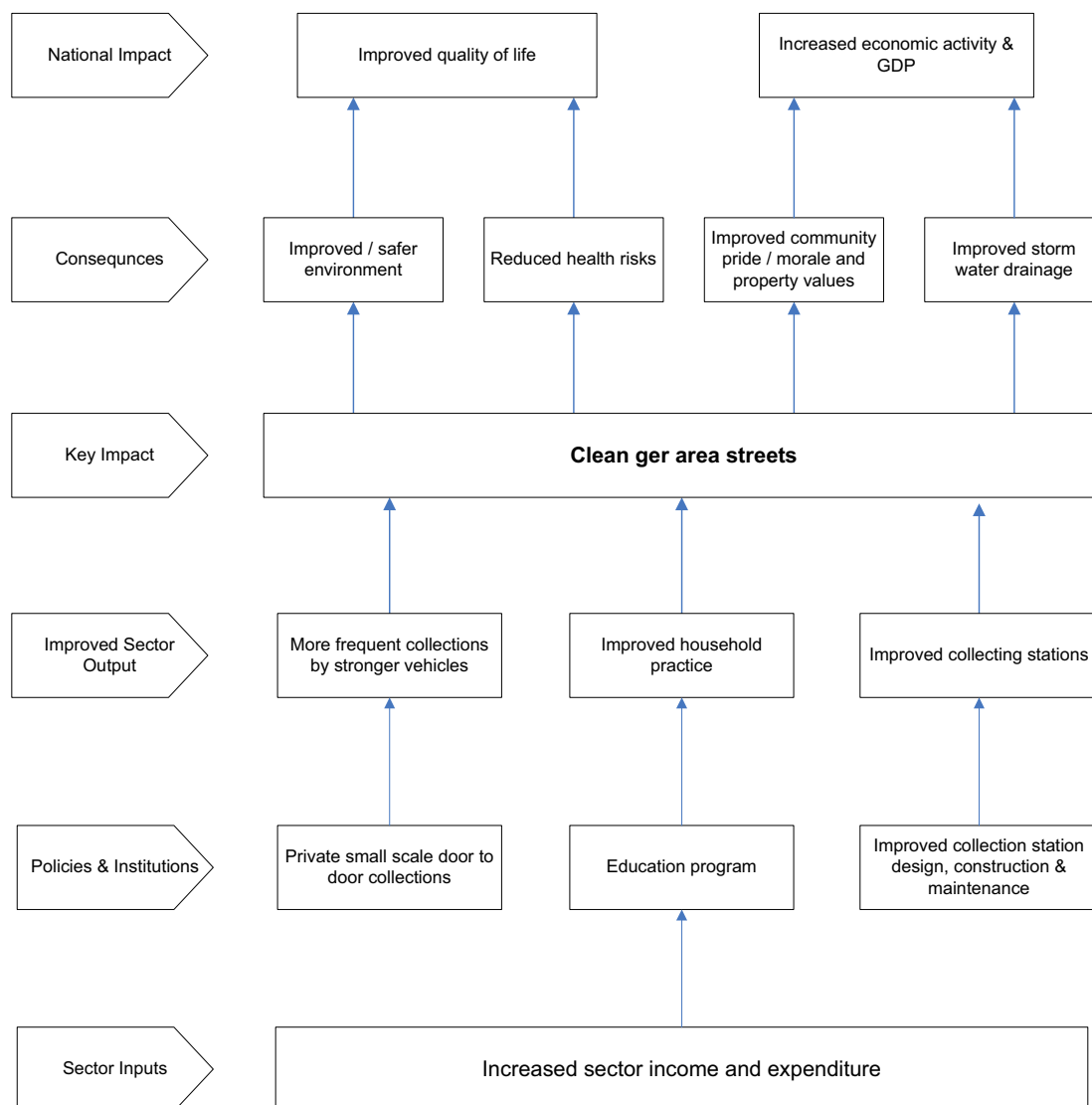


Figure 6: Example of Objective "Tree" Diagram

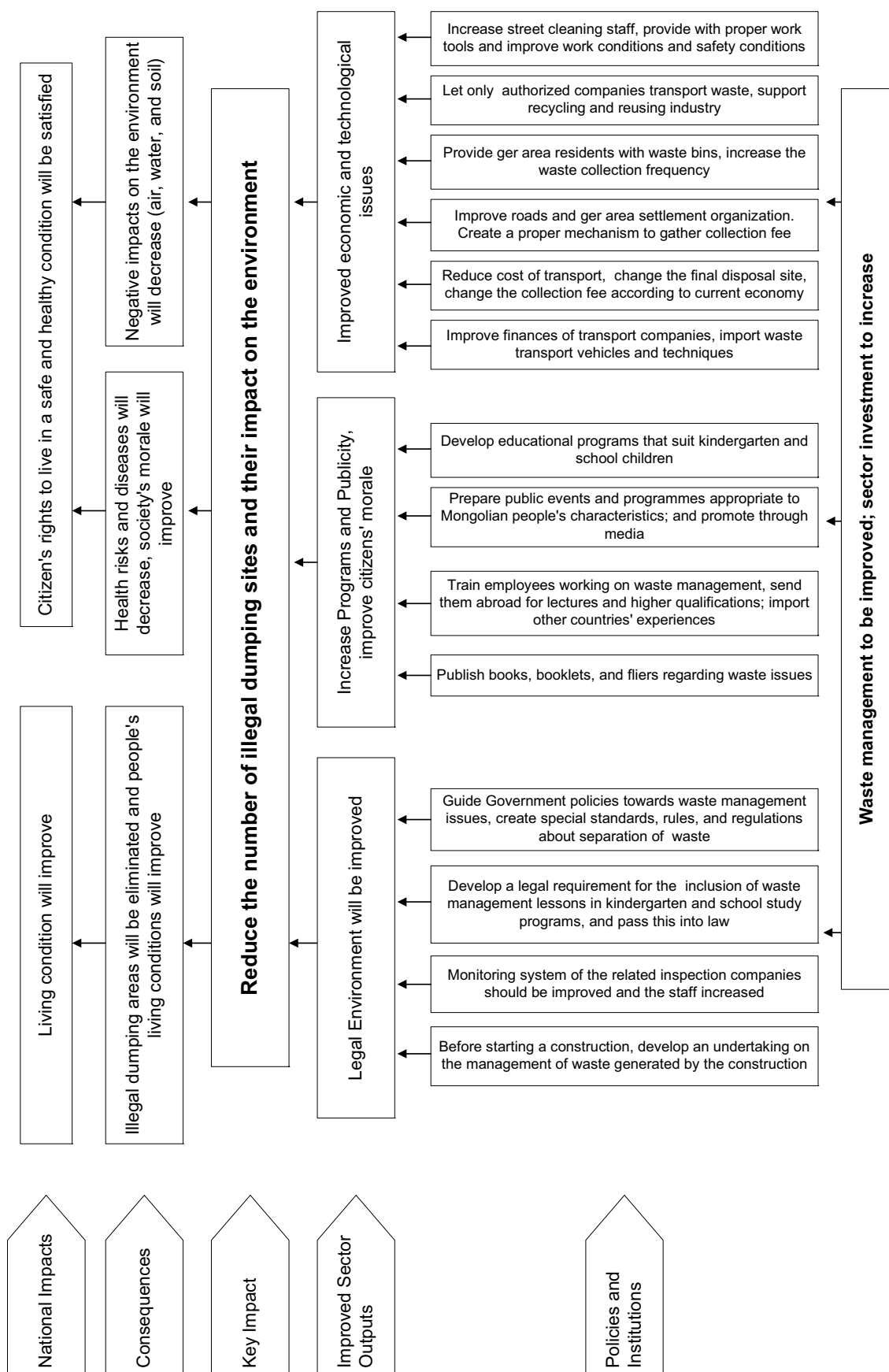


Figure 7: Reduce the number of illegal dumping sites and their impact on the environment- Objective "Tree" (Group A)

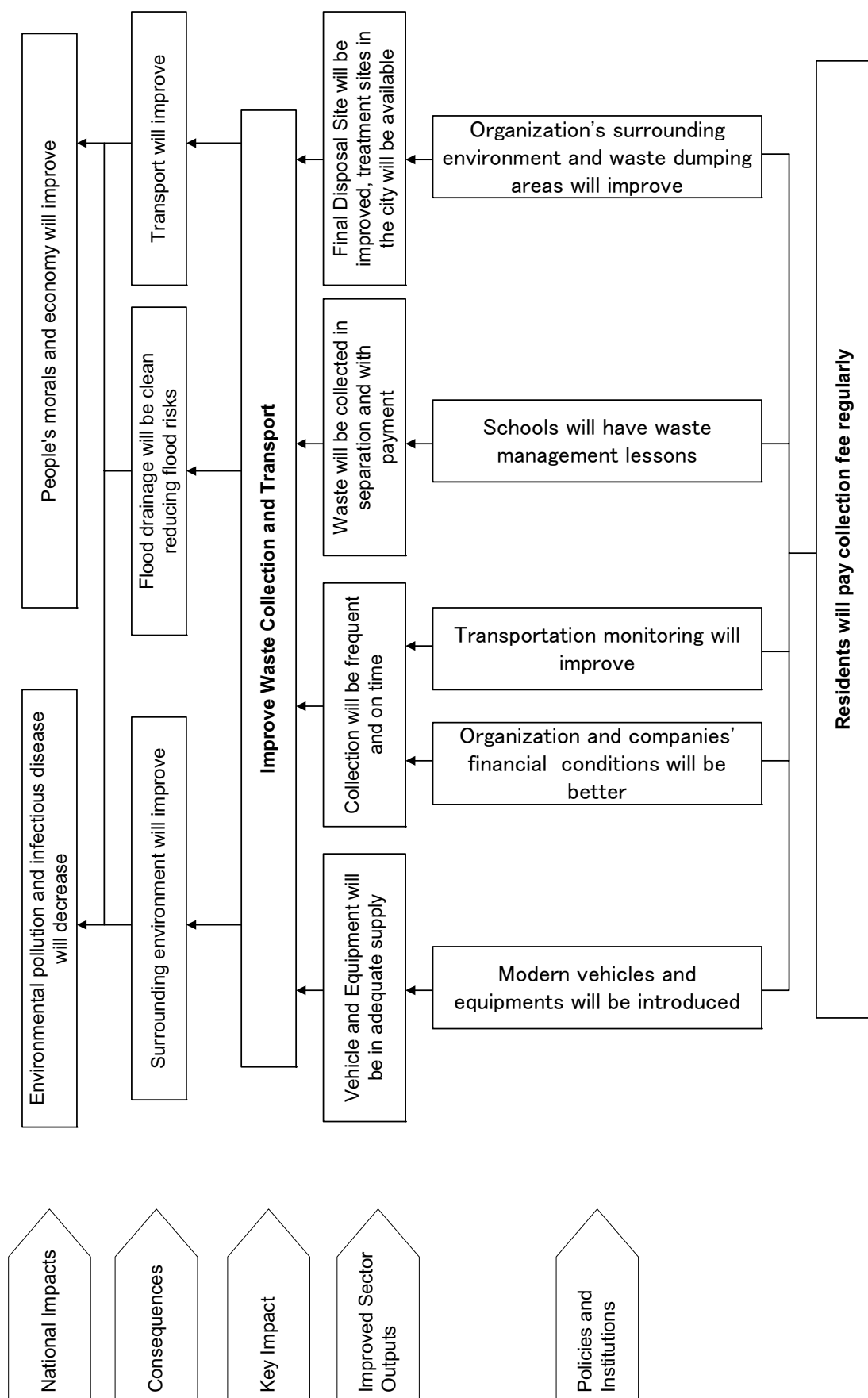


Figure 8: Improve Waste Collection and Transport-Objective "Tree" (Group B)

Group C

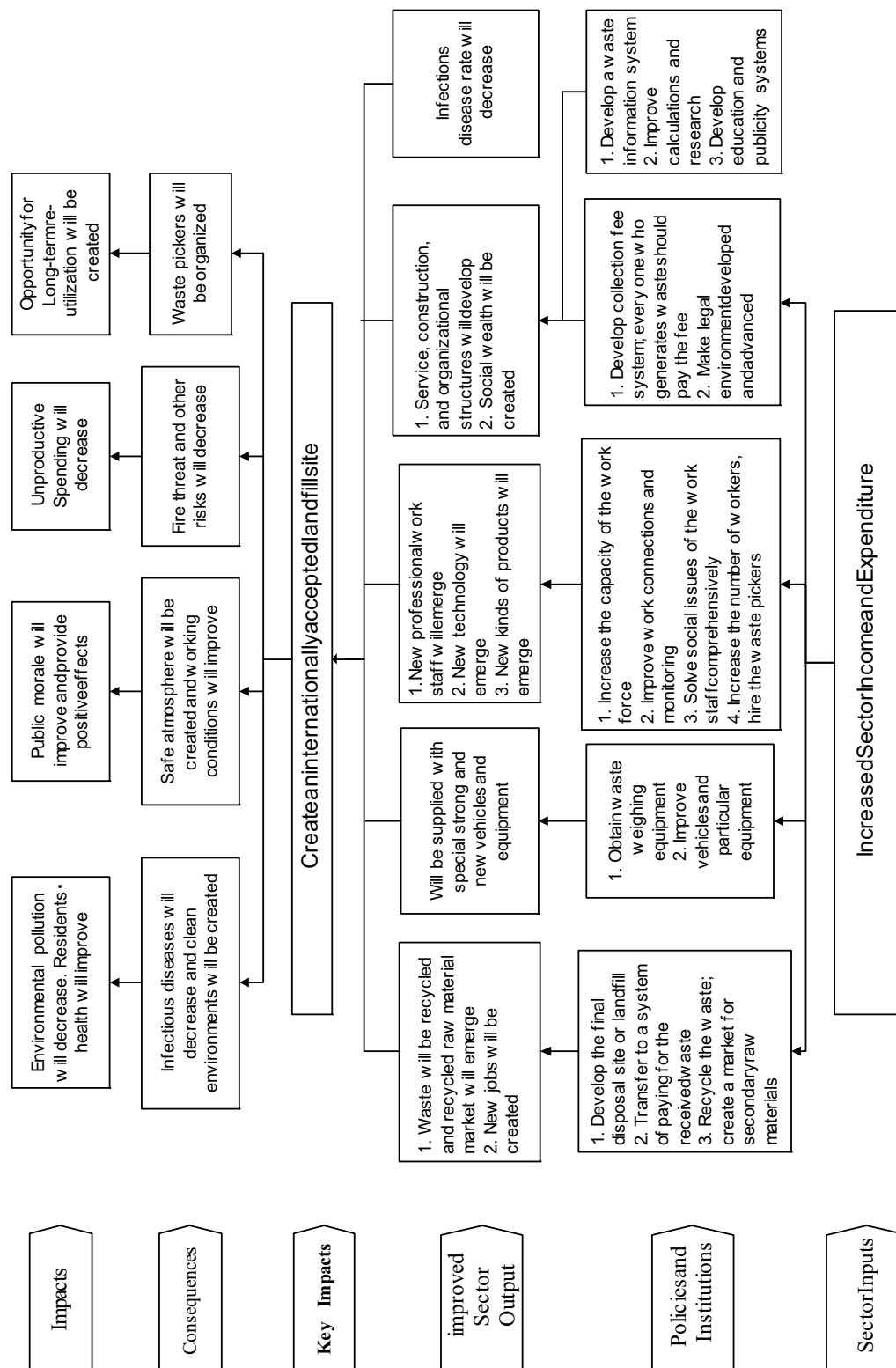


Figure 9: Create an Internationally accepted landfill site- Objective "Tree"

Group D

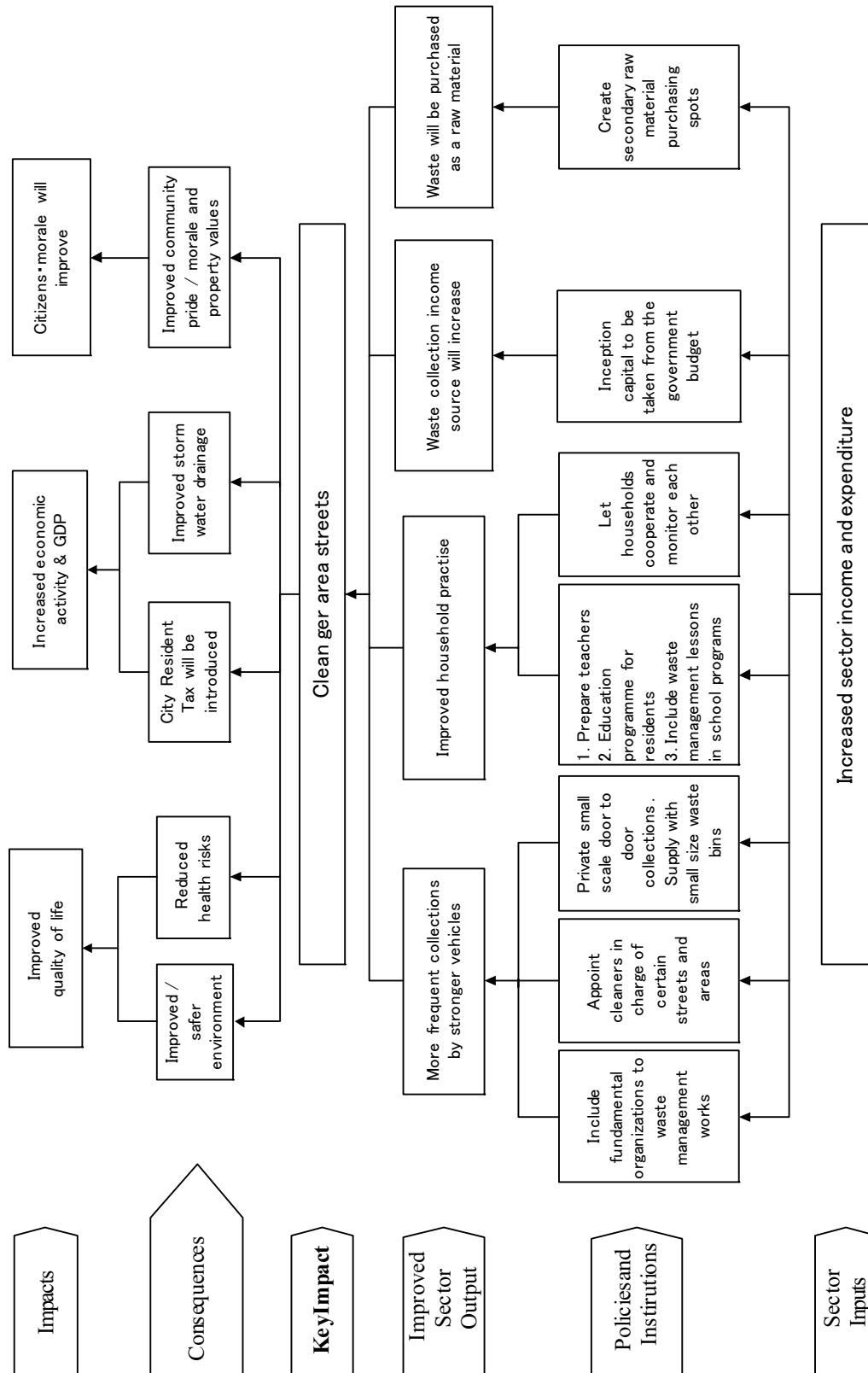


Figure 10: Clean Ger area streets-Objective "Tree"

6 Stakeholder Views

An important part of the Workshop, greatly appreciated by the participants, was the opportunity to present to the Workshop and the Study their views, as representatives and citizens, on their future role in solid waste management and on any advice they had for the Study. This part of the Workshop was lead by Mr Badam Delgerbayar. Appendix 5 presents these stakeholder views.

7 Evaluation of the Success of the Workshop

Appendix 6 presents the Participant Evaluation Sheet for the Workshop and the consolidated evaluation. 24 participants completed the sheets, rating performance between a "poor" of 1 to "excellent" of 5 on four criteria:

- a. Was the Workshop useful to you?
- b. Do you think that the Workshop advanced the common understanding of problems and the recognition of the need for joint co-operation?
- c. Was the conduct of the Workshop efficient and enjoyable?
- d. How do you rate the overall success of the Workshop?

There were no scores below the "average" of 3. Most scores were either "very good" or, the majority for all criteria, excellent:, with 58%, 71%, 67% and 63% excellent respectively for the four criteria. The mean scores out of the maximum of 5 were 4.5 or 4.6. The mean scores as a percentage of the maximum possible were 91%, 93%, 92% and 91% respectively for the four criteria. Figure 11 illustrates the aggregate performance for the four criteria.

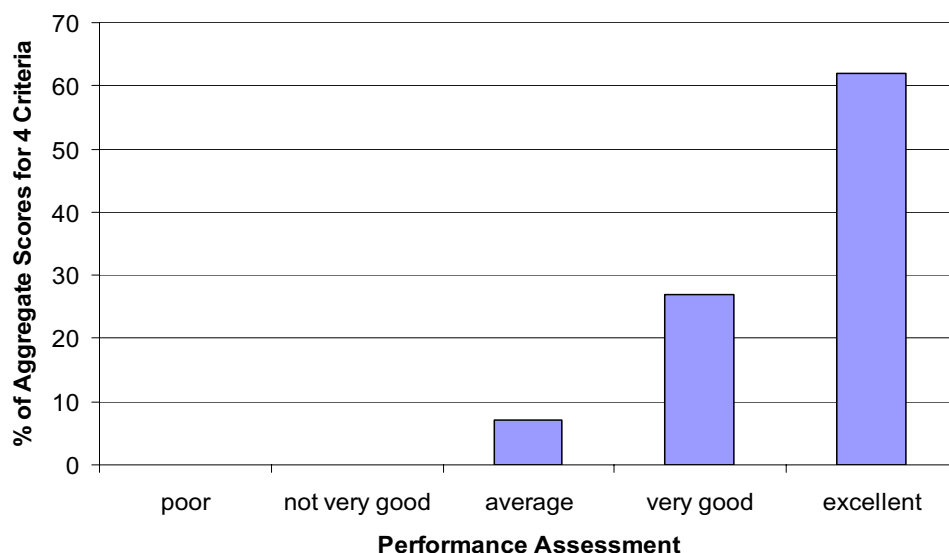


Figure 11: Aggregate Workshop Performance for All Criteria

Appendix 1: Workshop Invitees

No	Organization	Work Title	Name	Group
1	UB City Government	Deputy Governor	B. Baatarzorig	
2	Mayor's Office	General Manager of Ulaanbaatar City and Chairman of the Governor's Office	G. Munkhbayar	
3		Chief of City Development, Strategic Policy and Planning Department	Ch. Bat	A
4		Specialist of City Development, Strategic Policy and Planning Department	Ch. Batsaikhan	B
	Governor's Office	Head of the City Modernization Department Specialist	L. Baatartsogt	D
5		Head of Public Service Department	Ts. Bold	C
6		Officer of Public Service Department	B. Delgerbayar	A
7		Officer of Public Service Department	Ch. Badamkhand	B
8		Officer of Public Service Department	P. Enkhtuya	C
9		Officer of Public Service Department	T. Buyanjargal	D
10		Head of Department of Sustainable Development and Environment	A. Namkhai	A
11	Ministry of Nature and Environment	Deputy Director of Department of Sustainable Development and Environment	B. Bayasgalan	B
12		Officer of Department of Sustainable Development and Environment	M. Zoljargal	C
13		Secretary of Environmental Impact Assessment Working Group, Department of Sustainable Development and Environment	S. Erdenetsetseg	D
14		Head of International Cooperation Department	N. Oyundari	A
15		Senior Officer of International Cooperation Department	D. Erdenebulgan	B
16		Head of Production Policy and Coordination Department	Mr. Badarch	C
17	Ministry of Industry and Trade	Senior Officer of Industrial Policy Adjustment Department	B. Bayasgalan	D
18		Policy Adjustment Department, Officer for Environmental Public Health Affairs	Ms. Enkhtsetseg	A
19	Ministry of Health	Chief	G. Budragchaa	B
20	Department of Nature and Environment	Director	G. Bold	C
21	Institution of City Planning and Research	Head of Natural and Infrastructural Inspection Division	Ts. Tsengel	D
22	City Specialized Inspection Department	Inspector of Nature and Environment	N. Oyuntsetseg	A
23		Head of Public Health Monitoring Department	L. Byambasuren	B
24		State Inspector of Public Health Monitoring Department	Ms. Oyun	C
25		Head of Central Laboratory	S. Bumaa	D

26		Head	Mr. Munkhtsog	A
27	Department of Apartment Service and Utilities	Head of Modernization, Production, and Service Department	B. Naranmunkh	B
28	Bayanzurkh District Governor's Office	Senior Specialist Modernization, Production, and Service Department	D. Gendenpuntsag	C
29	Bayangol District Governor's Office	Head of Modernization, Production, and Service Department	G. Oyuntsetseg	D
30	Sukhbaatar District Governor's Office	Head of Modernization, Production, and Service Department	J. Jambaldorj	A
31	Songinokhairkhan District Governor's Office	Head of Modernization, Production, and Service Department	Ch. Oyunbaatar	B
32	Khan Uul District Governor's Office	Head of Modernization, Production, and Service Department	D. Oyuntuya	C
33	Chingeltei District Governor's Office	Head of Modernization, Production, and Service Department	M. Baatarsogt	D
34	Nalaikh District Governor's Office	Head of Modernization, Production, and Service Department	D. Baatarkhuu	A
35	Bagakhangai District Governor's Office	Head of Modernization, Production, and Service Department	B. Erdenechimeg	B
36	Baganuur District Governor's Office	Head	B. Naran	C
37	"Nuuts" Company Ltd.	Director	Ts. Tsogtsaikhan	D
38	Bayanzurkh District Renovation Company	Director	D. Batsaikhan	A
39	Bayangol District Renovation Company	Director	Ts. Battuvshin	B
40	Sukhbaatar District Renovation Company	Director	R. Dondov	C
41	Songinokhairkhan District Renovation Company	Director	P. Ganbaatar	D
42	Khan Uul District Renovation Company	Director	Ch. Enkhbold	A
43	Chingeltei District Renovation Company	Director	Z. Erdenekhuu	B
44	Nalaikh District Renovation Company	Director	B. Byambadorj	C
45	Baganuur District Renovation Company	Head	N. Sodnompil	D
46	"Baigal Erdene San" NGO	Specialist	L. Dolgormaa	A
47	"WWF"	Head	D. Gantigmaa	B
48	"Tuul 21" NGO	Head	G. Tsetsemaa	C
49	"Ariun Orchin" NGO	Citizen	Mr. Erdenebaatar	D
50	Community Representative			

Appendix 2: Workshop Program

Day 1

9th December 2004 (Thursday)		
Topic	Expositor	Time
1. Opening Address by Mongolian Side	UB City	9.00
2. Opening Address by the Japanese Side	JICA	9.10
3. Explanation of the Study and Workshop	Study Team	9.20
4a. Assess Sector Performance	Participants in 4 Groups (mixed organizations) discuss.	9.45
Tea		10.30
4b.continued	Groups report on main problems etc.	10.45
4c. Synthesize 4 main problem areas	Study Team	11.15
5a. Cause-effect Analysis	Study Team introduce. Participant Groups	11.30
5b.continued	Groups Report	12.00
6. Roundup of the Results	Study Team	12.30
Lunch		13.00

Day 2

10th December 2004 (Friday)		
Topic	Expositor	Time
1. Explanation of the Workshop	Study Team	9.00
2. Finalize cause-effect trees	Study Team. Participant response.	9.15
3a. Develop Objective Trees to Overcome Problems	Study Team introduce. Participant Groups.	10.00
Tea		10.30
3b.continued	Groups Report	10.45
4. Organization Roles	Participants invited to report on any needs for greater awareness of their role.	11.15
5. Roundup of Scope	Study Team	12.00
6. Workshop Evaluation	Participants.	12.15
7. Approach to solutions, role and responsibility of each related organization	Study Team	12.30
Lunch		13.00

Appendix 3: Opening addresses

A.3.1. Opening address by Mr G. Munkhbayar, General Manager of the City Governor's Office

Good morning Ladies and Gentlemen,

On behalf of the presidium of the Capital City's Citizens Representative Khural, the City Governor and personally, I would like to express my gratitude to all members invited from different organizations for attending this workshop for the Study of Solid Waste Management for Ulaanbaatar city in Mongolia funded by the Japanese Government.

The master plan for the improvement of Solid Waste Management for Ulaanbaatar City in Mongolia will be formulated within 16 months by the joint efforts of the Japanese Government and Japanese International Cooperation Agency (JICA). Within the scope of this work the following will be undertaken:

- determining of waste amount, structure, and quality
- current condition of waste collection and transport
- developing an appropriate waste collection fee
- improvement of waste disposal operations
- enhancing human resource capacity
- estimation of future waste amount and composition survey
- set up of final disposal site
- recommendations for change and pilot projects, etc.

In order to implement this project a Steering Committee, Technical Working Group and Study Team have been established. All the government and administrative organizations working in the field of environment and waste will participate in this workshop to assist in implementing the study on time; and non governmental organisations and private sectors enterprises will also be extensively widely involved. Most of the members of the Working Group mentioned above is participating in this workshop presently. In this regard, I am not in doubt that your kind contributions and support will make a valuable contribution to implementing this project successfully.

We hold this workshop with the aim of evaluating and drawing conclusions about current waste conditions, and to find out ways to solve the key problems and determine optimum alternatives and to develop consensus building among the organizations related to waste management.

I hope that all the members and participants invited to this workshop will be innovative and try to make every effort to contribute, and I would like to wish good luck for the progress of this workshop.

Thank you for your kind attention.

A.3.2 Opening address by Mr. Yoshio Kanzaki, JICA Resident Representative in Mongolia

Good morning, ladies and gentlemen!

I am here greeting you representing JICA.

Firstly, I am very glad that, from this month on, we are able to conduct the Study on Solid Waste Management Plan for Ulaanbaatar City in Mongolia in cooperation with the related organizations of the Ulaanbaatar City Government as a counterpart. I also appreciate the Ulaanbaatar City Government for the preparatory works, including the establishment of the counterpart team, which is necessary for the implementation of the study, and for the office arrangements for the Study team in order to conduct the study smoothly.

JICA anticipates good success from the cooperation between the Ulaanbaatar City Government and the Ministry of Nature and Environment and expresses its gratitude for the earnest attitude of the Ulaanbaatar City Government in solving the waste related problems, such as cooperating with the Ministry on establishing working groups for identifying candidate sites for final disposal, and improvement of fee collection system for the waste collection service.

Although the JICA has been supporting the development of Mongolia in many areas, it is the first time that it is supporting the sector of SWM in Mongolia. As for the experience of JICA in related fields, it has conducted this kind of cooperation in many countries and learnt that SWM problems are related to the living environment of the residents in those countries and cities. Problems of SWM are not solved without understanding the lifestyle of local residents' in the area. Therefore, identifying the SWM problems in UBC through the discussion you are participating in is essential to formulate a practical Master Plan which is the ultimate goal of the study.

The purpose of this workshop is to allow you to discuss the SWM problems in UBC and what measures the Ulaanbaatar City Government should take and to reach consensus on how to implement the study. We hope that you will give us your frank opinions and comments throughout the workshop, which is to be conducted for these 2 days.

The person sitting on the left/right to me is Mr.Hidetoshi Kitawaki, who is the chairman of the JICA's advisory committee, and the person sitting on the left/right to me is Mr.Susumu Shimura, who is the leader of the study team.

So I would like to invite Mr.Shimura for more detailed explanation for the workshop, please.

Appendix 4: Important Problems in the Sector

The Groups identified the following important solid waste problems:

Group A

1. Waste is thrown openly outside
2. Waste is using too much space
3. It is polluting soil
4. Waste burns and pollutes the air
5. It is polluting water and wells
6. The amount of waste is unnecessarily large because there is no separation done at the initial stage
7. People and animal are eating openly dumped waste and transferring infectious disease
8. It is becoming a source of increasing insects and rodents
9. Waste is blown around by the wind and pollutes the environment
10. Waste transport vehicles and mechanisms are in short supply
11. Residents lack the principles and knowledge for dealing properly with waste
12. The collection fee is not collected fully
13. The knowledge about the laws concerning waste is low and the law on implementation is inadequate
14. Public information, arguments, and introductions about waste issues are insufficient.
15. New illegal dumping areas are created because unauthorized transport companies dump waste at illegal spots
16. Household waste is not separated from dangerous waste, causing risks to public
17. Waste is thrown into storm-water drains and dams causing blockages
18. Waste bins in the streets are not enough
19. There are no programs about waste management in kindergartens and schools
20. There is no organized schedule for waste collection causing residents to throw out their waste at any time
21. It is not clear who will / and how to dispose of industrial waste; causing organizations to throw dangerous solid and liquid wastes any where, thus polluting the environment
22. There is no sewerage system in the Ger areas - thus every family digs a hole for their sewage and when it is full and frozen they dig it out and throw it together with the household wastes
23. People lack knowledge about dangerous wastes
24. Apartment waste chutes emit very bad smells
25. Recycling and reusing and the 3 "R" concept are not recognized and utilized
26. There is not enough brochures and books about waste management
27. The waste amount, composition, and quality of the wastes generated in Ulaanbaatar city is unknown due to lack of documentation and information

Group B

1. The Legal System is ineffective
2. Waste is not collected on time
 - a. Vehicles and equipment are not maintained and renewed regularly
 - b. The collection fee is not paid due to the low living standard
3. Health risks increase due to increased open dumping caused by irregular collection time
4. Knowledge about wastes polluting the environment and causing health risks is too little and there are not enough programs and lectures
5. There is no waste separation and the waste is not reused or recycled
6. There is no mechanism that allows recycling and reusing dangerous wastes such as batteries and car oils.
7. Industrial waste and wastes that include heavy metals like chrome are not buried properly, and there is no mechanism for this procedure
8. There is no disposal site for medical and dangerous chemical wastes, causing environmental and health problems
9. Wide usage of plastic bags that don't get absorbed by the nature and soil
10. Wrong ideology of residents - that some people generate waste and others are supposed to clean it up

11. Technology is out of date and inadequate
12. Include lessons about waste management in kindergarten and high school programs
13. Create a waste management fund complying with the laws
14. Improve living condition of Ulaanbaatar residents

Group C

1. Resolve the waste collecting issue (household, industrial, dangerous wastes) and streets, roads, and waste bins
2. Resolve the transport issue
3. Establish a final disposal area and intermediate treatment facility
4. Create a suitable infrastructure
5. Recycle

Group D

1. Ger area dams and storm-water drains are filled with waste
2. There is no waste separation
3. Vehicles and technology are outdated and insufficient
4. People's morale is low
5. Waste is polluting the soil, water, and the air
6. The organization of Ger area streets is bad
7. Publicity about the law and regulations is insufficient
8. People's cooperation and monitoring of each other is poor
9. Waste collection fees are not collected fully due to unorganized address registration
10. There are many families with livestock, which is a reason for large amount of wastes

Appendix 5: Stakeholder Views

The following comments were made during item 4 Day 2 of the Workshop.

1. Ministry of Nature and Environment, Officer Department of Sustainable Development and Environment M. Zoljargal:

Before giving my own suggestions, I would like to ask a few questions from specialists from related fields:

1. There are many families who live in up in the mountains where the government services can not reach. The vehicles can not reach their residences due to the heavy snow, slippery roads, and blocked paths. What can be done about this problem?
2. What kinds of difficulties arise when industrial waste is collected?

Bayanzurkh District Renovation Company Director Ts. Tsogtsaikhan answered the question: City development policy should include the organizational issues of Ger areas. Concerning the vehicles not being able to reach families who live on high ground - I would like to say that Ministry of Health should institute a decision on sewage management. A lot of Ger area residents dig holes on their land for their sewage, and when it is full and they dig it out and throw it outside their property. Residents of Ger areas cannot pay for bread, thus increasing waste collection fees will be an improper policy. Government should generate a policy that allows waste collection fees to be collected as part of general taxes.

My own comments are that there is not enough research done; thus we cannot establish the accurate waste collection fee rate. Thus we need more information and research materials.

2. Khan Uul District Renovation Company Director P. Ganbaatar:

I would like to talk about Industrial Waste. Companies and Factories transport their own waste. They don't have proper vehicles and they use open dump trucks. This causes the waste to spill out during the transportation causing environmental pollution and infectious disease risks. Only few of the companies have a contract with our organization to transport their industrial waste. Construction waste mainly consists of soil, stone, and gravel. These materials could be used as a material to develop green areas, hills etc. Infertile soil could be buried in a special area. There are situations where construction companies need to dig a hole and transport the soil to another place, and after the completion of their work transport back the soil to even out the ground. These situations could be dealt with by waste transport companies and for their economic benefit, as they would charge for the transport service. The vehicles used for waste transport are old, use too much fuel, and have open compartments. Residents should pay waste collection fees in combination with taxes.

Question from Mr. Delgerbayar:

Do the construction companies transport their own waste by themselves?

-Yes, most of them transport with their own trucks. Few companies contract with us.

3. Officer of Industrial Policy Adjustment Department of Ministry of Industry and Trade B. Bayasgalan:

Public Opinion Surveys should be conducted and there should be three small pilot projects implemented:

1. Pilot project to clean the streets.
2. Pilot project on industrial waste management.

3. Pilot project on medical waste.

The results of these three pilot projects should be made public and disseminated to the public through various media. The pilot projects should indicate the amount of waste that is reused, recycled, and disposed of after separation. The waste pickers can be employed as street cleaners or patrols, paid, and required to submit reports and advertise to the public.

Additionally, the rate of collection payment is only 30-40%; and this situation is likely to persist for long period of time. Families who have no ability to pay should be identified and payments made up from government budget or various aid sources.

4. G. Budragchaa, a chief of the Department of Nature and Environment:

I highly value this workshop's significance. My personal impression is very good because the organizations and their representatives have participated very well.

There are 2-3 issues related to waste management:

- Waste will always be generated. There should be a psychological environment and morals set against throwing waste outside. This is the cheapest and most basic work that can be done compared to renovating vehicles or improving the finances.

- Recycling of waste. The process has started, there are synthetic bags being recycled and reused, and water bottles are being melted and used for building electricity poles. People should use everything that can be used.

- Transport issues, especially, transport of non-recyclable wastes. Introduce new means of transport, and improve organisation's finances.

Most importantly, set morals so that people won't litter in open areas and then waste money to clean it up.

There is a plan to create a final disposal area for dangerous chemical wastes at Takhir Soyot in Songinokhairkhan District. The plan is halfway through, the design and budget is completed, but unimplemented due to financial difficulties.

The area in Ulaanbaatar city that is called "summer housing" but is used throughout the year is expanding. This will bring out many concerns in future. There should be one organisation that is in charge of summer house area activities and management.

Maybe I ought to talk about liquid waste too. I don't know whether the sewer from households is included in the project. The summer house sewer will create great problems in future. This should be included in the project.

5. Director of Institution of City Planning and Research G. Bold:

The Final Disposal Area should be set by our organization. This year, we will complete the general Clarification of a site to be used until the year of 2020. We will pay attention to the issue of the final disposal area. Personally, I look at waste as an industrial raw material. Household waste management awareness should be developed. The waste amount is increasing due to rapid industrialism too. This should be taken into consideration from this initial stage of industrialization. The tradition of our ancestors of cleaning out the old settlement site before leaving should be remembered to help develop people's morals.

6. Central Laboratory Head of City Specialized Inspection Department S. Bumaa:

Waste is always at the center of my attention as I work as an inspection officer. I am willing to cooperate in some way in this project. I think that the monitoring and inspection responsibilities should be transferred to organizations which deal with the waste transport and to citizens.

Chemical waste with radiation should not be openly dumped, it should be buried. This should be included specifically in the Master Plan.

Waste Quality and Composition Analysis should be done by a specially appointed group according to a specific plan. Analyze the levels of bacteria in the waste from ger areas. There is large amount of lead found in the soil composition. The areas with high incidences of heavy metals should be treated with specific technology. If the budget is approved by the Ministries, we could conduct some of the analysis.

7. State inspector of Nature and Environment of City Specialized Inspection Department N. Oyuntsetseg:

I would like to add one thing. District, Khoroo, and Bag Governors should be involved and trained.

Comment from Khan Uul District Renovation Company Director P. Ganbaatar:

The penalty and fine should reach the appropriate party. Household waste is generated by households and industrial waste is generated by factories but the Specialized Inspection Department fines the Renovation Companies for transgressions of the regulations! Every Khoroo should have at least one inspector to help make up for the heavy shortage of staff.

8. Head of Modernization, Production, and Service Department of Khan Uul District Governor's Office Ch. Oyunbaatar:

This workshop has been very effective. There are lots of things to suggest but I have to limit them according to the state budget. I would like to express my appreciation to the people who initiated this project. There should be broad inclusion of both Government Organizations and citizens. There should be one or two major inspection events held each year, involving all companies and organizations in the city. The event should demonstrate the Inspection Authority's power and should carry a warning note for all organizations and companies in terms of waste management. Reports and related information should be broadcast to the public. The laws should be publicized separately at the appropriate level; advertisements could be displayed on billboards and shown on TV.

There should be rewards from Government for people working on waste management. Let people work for rewards bearing in mind the fact that many people working in the sector are less capable than most and have been poorly educated. Establish a management plan that suits Mongolian weather conditions.

Comment from Central Laboratory Head of City Specialized Inspection Department S. Bumaa:

Street Waste inspection authority should be given to the Renovation Companies of that District and authorities related to this field.

Answer from Ministry of Nature and Environment, Officer Department of Sustainable Development and Environment M. Zoljargal:

Governors at all levels have an inspection authority. They should appoint public inspectors for this work. There is a discussion going on about appointing public officers from within District renovation companies.

Number of Participants objected:

The Governor's authority is not effective enough – better to be in the hands of the Renovation Companies and others.!

9. Head of “Nuuts” Company B. Naran:

The fact that there are many representatives and specialists from various Ministries participating here at the workshop is very significant. The difficulties will keep on occurring if monitoring is not improved. Experiences from countries that have already solved waste management issues should be imported and reflected in the plan.

The cost estimation should be revised. The collection fee is still at the rate set in 1999 and it is resulting in a deficit for many waste transport companies. Special vehicles should be introduced.

The working conditions at the final disposal area should be improved by building garages and warm workplaces and providing electricity and a water system.

10. Head of the Songinokhairkhan District Renovation Company R. Dondov:

There should be special discount on the tax for private companies who are importing waste transport vehicles from abroad. Sod Mongol Company, for example, is importing large size containers for Ger area households and they are currently negotiating the import tax.

There are no clear boundaries between the responsibilities of the various organizations on this issue. Aside from the law, there should be some guidance about what the City should be in charge of and what the Districts should be in charge of. Now, everything is left to the Renovation Companies.

There should be special border tax rates for products that generate large amounts of waste and the revenue should go to companies engaged in cleaning the waste.

11. Head of the “Baigal Erdene San” NGO Mr. Sodnompil:

I would like to express thanks to the JICA team who spent some time and money for this project. In the past there was only one law and everything was fine, now there are hundreds of different laws and none is working. Thus, this kind of event is very helpful; especially it should be publicized in schools and kindergartens and on TV and radio. Recently, there was held a drawing competition about Selbe River among schools. One second grade girl drew a painting on which the lion from the Selbe river bridge was running away from the waste that is in the river.

Waste recycling and treatment sites should be built in the middle of the Districts. Only treated waste that is unusable should reach the final disposal area, thereby eliminating the need for waste pickers at the area. NGOs are a very effective work force; they should be employed and included in the Plan.

12. Head of Modernization, Production, and Service Department of Bayanzurkh District Governor's Office B. Naranmunkh:

Most importantly, there should be established and properly developed a waste pricing system, whereby waste has a value and can be traded. The management of household wastes should be improved. Government should support the companies that separate, recycle, and export wastes by discounts on some taxes. Renovation companies should be included in the management and their attention can be attracted by catering for their interests eg. by financial benefits. If specific policies can be devised

companies can improve their management accordingly. Government should assist on the land for a treatment facility.

13. Closing Speech from Mr. Delgerbayar:

I would like to say that, in my opinion, the workshop seems to have been completed successfully. I hope that there will be some work done in preparing specialists related to the waste management field by sending them to various lectures and training both abroad and in Mongolia.

The following comments were made during item 6 Day 2 of the Workshop, and were written on the Evaluation Sheets

1. Inspector of Nature and Environment of City Specialized Inspection Department N. Oyuntsetseg:

Involve people from the Management level.

2. Sukhbaatar District Governor's Office, Badambazar:

We would like to make Sukhbaatar District Khoroo 13 the model area for the pilot project and would like to cooperate in reaching conclusions. Additionally we propose to cooperate in implementing a small project about reusing ger area ash waste during this period.

3. Officer of Public Service Department of Governor's Office P. Enkhtuya:

- a) Involve related field staff in short and long-term waste management training programmes conducted both domestically and abroad.
- b) Supply related organizations with waste transport and snow clearing vehicles.
- c) Implement a small scale project for supporting companies that deal with recycling and preparing secondary raw materials.

4. Officer of Public Service Department of Governor's Office B. Delgerbayar:

I would like to express my gratitude toward JICA, City, and Governor's Office for organizing this workshop. Workshop was successful and professional. I think the suggestions that were made by participants during the workshop will play an important role in the project implementation.

5. Head of Modernization, Production, and Service Department of Khan Uul District Governor's Office Ch. Oyunbaatar:

- Permit organizations to transport their waste through Renovation companies only.
- Provide loans to Renovation companies from the Asian Development Bank or similar international organizations to help manage waste in the city.

6. Manager of Sukhbaatar District Renovation Company D. Sukhbat:

I think the workshop was completed with good results. I believe the issues covered in the workshop will be realized. Thank you.

7. Engineer of Nalaikh District Renovation Company B. Batnasan:

Train the staff of renovation companies and improve their knowledge.

8. Head of Modernization, Production, and Service Department of Bagakhangai District Governor's Office D. Baatarkhuu:

If the workshop was conducted every season it would be more productive.

9. Head of Modernization, Production, and Service Department of Bayanzurkh District Governor's Office B. Naranmunkh:

If there were more introductory materials, the workshop aim and intentions will be more clear.

10. Director of Songinokhairkhan District Renovation Company R. Dondov:

Provide import tax discounts on imported equipment.

11. Officer of Department of Sustainable Development and Environment of Ministry of Nature and Environment M. Zoljargal:

Include the fundamental unit which is the Governors of Khoros and their staff.

Also include staffs who work on-site.

12. Director of Bayanzurkh District Renovation Company Ts. Tsogtsaikhan:

Include Khoroo Governor's Office representatives.

13. Head of Modernization, Production, and Service Department of Nalaikh District Governor's Office M. Baatartsogt:

I think that the research period by the study team is too long.

14. Head of the City Modernization Department Specialist of Governor's Office L. Baatartsogt:

It would be more productive if you make the Master Plan target and issues specific and open to everyone and then accordingly record our opinions and exchange ideas.

15. Head of "Baigal Erdene San" NGO N. Sodnompil:

For the next workshop, it is beneficial if citizens', youths', and students' representatives are invited.

16. Director of Khan Uul District Renovation Company P. Ganbaatar:

- It is necessary to visit developed countries' experience.
- Supply vehicles to renovation companies.

17. Head of "Ariun Orchin" NGO G. Tsetsegmaa:

- Disinfect the waste.
- Take into account medical waste and its management.
- Flies are increasing and transfer disease during periods of highly infectious diseases.

18. Director of Institution of City Planning and Research G. Bold:

I suppose the next workshop will be done like this workshop.

19. Senior Officer of Industrial Policy Adjustment Department of Ministry of Industry and Trade B. Bayasgalan:

- Publicize the Study progress and results
- Include fully all the authorities and representatives from related organizations.

20. Head of Central Laboratory of City Specialized Inspection Department S. Bumaa:

Please implement the next workshop mainly to deal with the management issues.

21. State Inspector of Nature and Environment of City Specialized Inspection Department D. Delgerbayar:

Provide information about other countries' waste management.

22. Officer of Public Service Department of Governor's Office T. Buyanjargal:

I think it is also useful to include other companies

Appendix 6: Participant Evaluation

PARTICIPANT EVALUATION SHEET

Name.....

Position.....

Contact Tel. No.

Please circle 1-5 to score the criteria in the following way:

- 1 = poor
- 2 = not very good
- 3 = average
- 4 = very good
- 5 = excellent

A. Was the Workshop useful to you?

1 2 3 4 5

B. Do you think that the Workshop advanced the common understanding of problems and the recognition of the need for joint co-operation?

1 2 3 4 5

C. Was the conduct of the Workshop efficient and enjoyable?

1 2 3 4 5

D. How do you rate the overall success of the Workshop?

1 2 3 4 5

Please make any comments you wish for the further consideration of the Study Team and / or the conduct of future Workshops.

.....

.....

.....

.....

.....

CONSOLIDATED PARTICIPANT EVALUATION

A. Was the Workshop useful to you?

	1	2	3	4	5	Total
scores	0	0	1	9	14	24
% scores	0%	0%	4%	38%	58%	100%
d.1.1.	Mean scores -		91%			
		4.5				

B. Do you think that the Workshop advanced the common understanding of problems and the recognition of the need for joint co-operation?

	1	2	3	4	5	Total
scores	0	0	2	5	17	24
% scores	0%	0%	8%	21%	71%	100%
d.1.2.	Mean scores -		93%			
		4.6				

C. Was the conduct of the Workshop efficient and enjoyable?

	1	2	3	4	5	Total
scores	0	0	2	6	16	24
% scores	0%	0%	8%	25%	67%	100%
d.1.3.	Mean scores -		92%			
		4.6				

D. How do you rate the overall success of the Workshop?

	1	2	3	4	5	Total
scores	0	0	2	7	15	24
% scores	0%	0%	8%	29%	63%	100%
Mean scores -			91%			
		4.5				

SUMMARY

No scores below "average".

Most scores were excellent: 58%, 63%, 67% and 71%.

Mean scores out of maximum of 5 were 4.5 or 4.6.

Mean scores as a % of maximum possible were 91%, 91%, 92% and 93%.

4.2.2 Second Workshop

THE STUDY ON SOLID WASTE MANAGEMENT PLAN FOR ULAANBAATAR CITY IN MONGOLIA

REPORT OF SECOND WORKSHOP

April 2005

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1 Introduction

The Study's Second Workshop was held, as scheduled in the Inception Report, on 11th April 2005; and it followed the outline of the Workshop presented there. Following discussion within the Municipality and with the Consultants Mr. Badam Delgerbayar, Officer in the City Public Services Department, arranged for 55 people to be invited from a broad spectrum of interested parties including Ministries, Municipality and District Offices, waste collection companies, NGOs and residents living close to each of the disposal site alternatives.

Appendix 1 presents the list of invitees. The venue was the Ulaanbaatar Hotel.

Appendix 2 presents the Workshop Program.

The Workshop was attended by representatives from JICA:

Mr. Yoshio Kanzaki, JICA Resident Representative in Mongolia

Ms Miho Sasaki, JICA Assistant Resident Representative in Mongolia.

Appendix 3 presents the opening addresses made by Mr. G. Munkhbayar, General Manager of the City Governor's Office, on behalf of the Municipality and by Mr. Yoshio Kanzaki, JICA Resident Representative in Mongolia, on behalf of JICA.

2 Objectives and Approach

The objective of the Workshop as stated in the Inception Report was to present alternatives for a new Final Disposal Site, discuss these and select the optimum alternative. This was refined as:

1. To understand the needs of siting future disposal sites for the formulation of the SWM Master Plan (M/P);
2. To examine and discuss the advantages and disadvantages of the SWM technical system alternatives for six candidates for future final disposal site(s); and
3. To make recommendations regarding future final disposal site(s) for SWM in Ulaanbaatar City.

Most of the work of the Workshop was undertaken within Groups. Participants were divided into four Groups. Group composition was deliberately mixed so that members were forced to relate to colleagues with different points of view rather than being trapped in the mindsets of their own organizations and interests.

Mr. Badam Delgerbayar, Officer in the City Public Services Department, and the JICA study Team Leader Mr. Susumu Shimura made a PowerPoint presentation setting out the objectives and procedure of the workshop (see Appendix 4). This material was also included in the workshop folders given to all participants.

3 Advantages and Disadvantages of Six Candidates as Future Disposal Sites

Mr. Badam Delgerbayar, Mr. Susumu Shimura and Mr. Ichiro Kono, JICA Study Team Member made a PowerPoint presentation (see Appendix 5) comprising:

1. Notice for comparison work;

2. Conditions for comparison;
3. Introduction of candidates;
4. Environmental issues; and
5. Technical and Financial issues.

This presentation material was also included in the workshop folders given to all participants in order to facilitate subsequent deliberation.

There was limited time for detailed individual site investigations following the approval of the list of candidate sites on 9th March 2005 but in addition to Team resources the National University was contracted to carry out field and literature investigations, and several participants congratulated the Counterpart Officers and the Team on the detail and comprehensiveness of the material.

Following the presentation participants were invited to ask questions to clarify matters. These questions and their answers are reported in Appendix 6.1.

4 Comparison of Candidate Sites

With 6 alternative sites, each described by 33 criteria and 55 participants in 4 Groups the Workshop was obviously tackling an enormous amount of variety in trying to come to a consensus decision. An attempt was therefore made to structure part of the deliberation in a rational manner using Difference Analysis to avoid resorting to spurious weighting systems. This approach concentrates on the differences between alternatives, ignoring things which are the same and which are therefore irrelevant to the task of distinguishing between them. Thus as part of their consideration each Group was first of all asked to select the five most important criteria and these were then synthesized as:

1. General Site Conditions
2. Costs
3. Social Impacts
4. Pollution Impacts
5. Life of the Site

Difference Analysis

The best indicator of Criteria 2. Cost is the Total Annual Cost in 2010 since it embraces all costs, including initial investment, and, unlike collection fee per household for example, incorporates the scale of activity rather than the unit cost alone. Criteria 5. Life of the Sites is already estimated by the Consultants and ranges from 2 to 16 years. The four teams were asked to assess the other three criteria along a scale of 0 for the best alternative to 5 for the worst. These assessments were then averaged and Figure 1 presents the results for the 6 sites and 5 criteria.

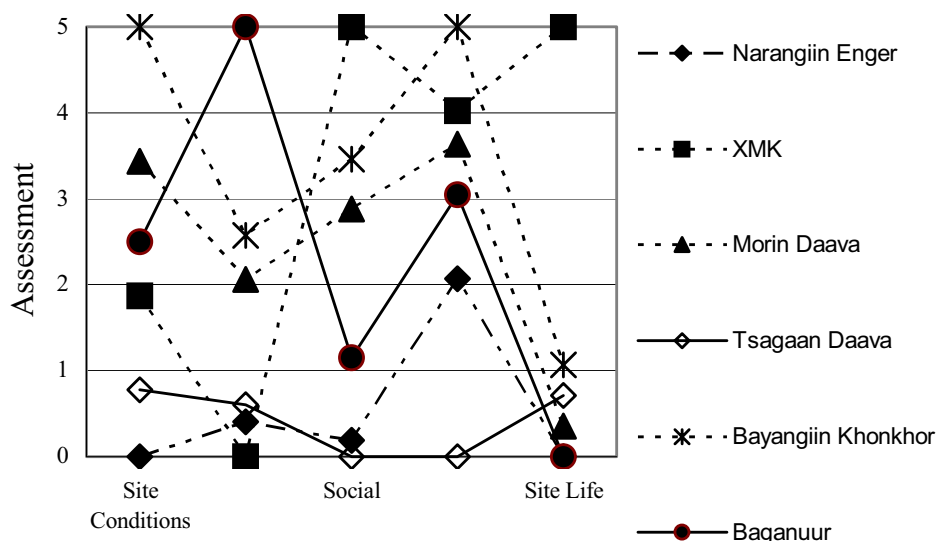


Figure 1: Assessment of Six Sites

If we are seeking only 1, 2 or even 3 sites then Bayangiin Khonkhor can be discounted since 3 sites are assessed as being better for all variables. XMK has a very short life and can only be considered as a short term or parallel site, not as a long-term solution. These two sites can therefore be excluded from further consideration and from Figure 2. below.

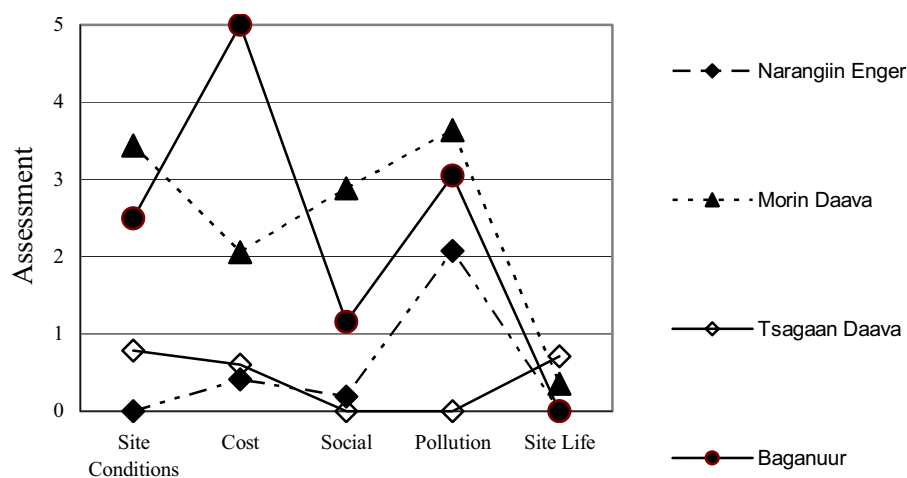


Figure 2: Assessment of Four Sites

The site lives of the remaining alternatives range from 14 to 16 years, which is within the margin of error of site investigations to date. Therefore Baganuur and Morin Davaa can be dismissed because the other two sites are clearly superior to them on all other criteria.

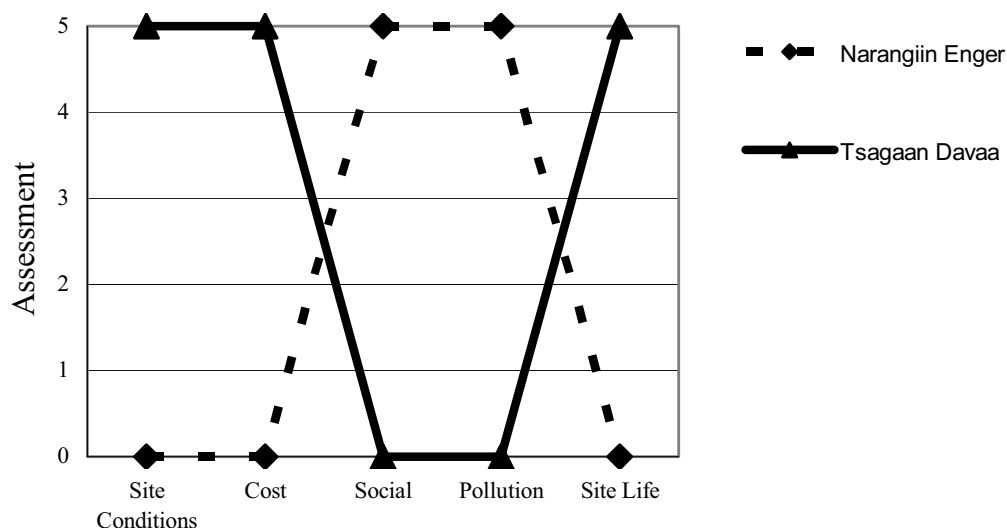


Figure 3: Assessment of Two Sites

Comparing the remaining Narangiin Enger and Tsagaan Davaa: Narangiin Enger is preferred on grounds of Site Conditions, Cost and Site Life; and Tsagaan Davaa is preferred on Social and Pollution grounds. A detailed consideration of the specific expected Social impacts indicates that no one lives within 1km of Tsagaan Davaa but there are 3 brick factories between 1.2 and 1.9 km. Seven people live at the Narangiin Enger site, where grazing is the only economic activity. Thus the Social differences between the two sites are small and are certainly not strongly in favor of Tsagaan Davaa.

The cost difference is MNT123 mill for 2010 increasing each year beyond this and amounting to a total of MNT1.5 bill when discounted over a 15 year life of the sites at 8%. In fact Narangiin Enger probably has a longer site life, and its general Site Conditions are regarded as being superior to those of Tsagaan Davaa.

It is therefore considered that, from the point of view of Difference Analysis, Narangiin Enger should be preferred over Tsagaan Davaa, at least for the initial stages of Master Plan implementation. Once this has been established it may be that Tsagaan Davaa could be introduced for parallel operation; thus reducing mean system-wide haulage distances.

Group Evaluation

The deliberations of the Groups are presented in Appendix A.6.2. and summarized in Table 1.

Table 4-1: Summary of Group Evaluations.

Group	First Choice	Second Choice
A	Narangiin Enger	No preference expressed
B	Narangiin Enger	Tsagaan Davaa
C	Narangiin Enger	Tsagaan Davaa
D	Narangiin Enger	Tsagaan Davaa

Thus the Group discussions came to the same conclusion as the Difference analysis.

Finally Mr. Delgerbayar asked the workshop participants to confirm that Narangiin Enger and Tsagaan Davaa should be recommended for consideration by the Steering Committee, which they did.

5 Evaluation of the Success of the Workshop

Appendix 7 presents the Participant Evaluation Sheet for the Workshop and the consolidated evaluation. 37 participants completed the sheets, rating performance between a "poor" of 1 to "excellent" of 5 on five criteria:

- a. Was the Workshop useful to you?
- b. Do you think that the Workshop advanced the common understanding of problems and the recognition of the need for joint co-operation?
- c. Do you think that the workshop made a positive contribution to the study?
- d. Was the conduct of the Workshop efficient and enjoyable?
- e. How do you rate the overall success of the Workshop?

Most scores were either "very good" or, the majority for all criteria, "excellent", with 70%, 65%, 76%, 73% and 70% excellent respectively for the five criteria a. to e.. The mean scores out of the maximum of 5 were 4.7, for four questions and 4.6 for one question. The mean scores as a percentage of the maximum possible were 94% for four questions and 93% for one. Figure 4 illustrates the aggregate performance for all five criteria.

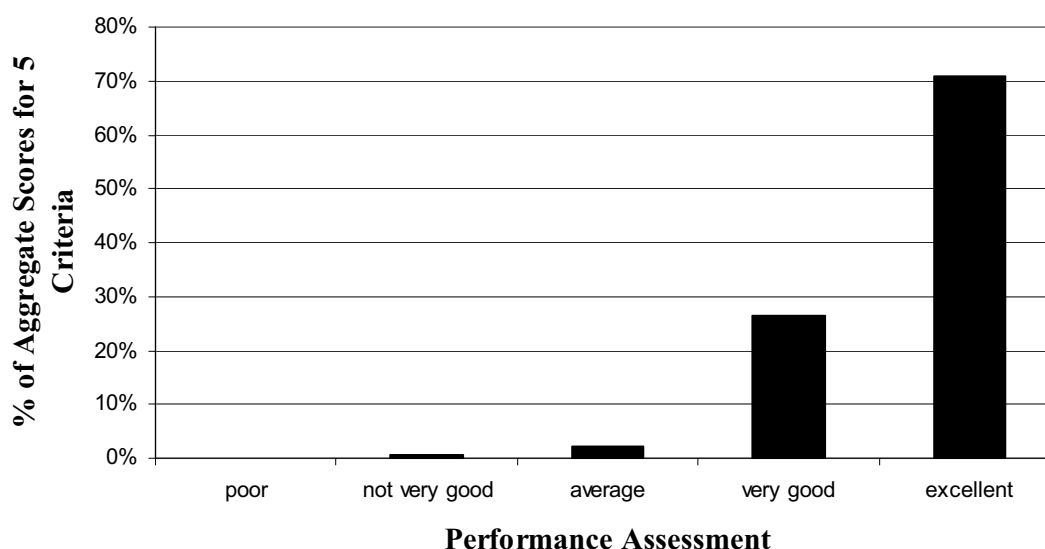


Figure 4: Aggregate Workshop Performance for All Criteria

Appendix 1: Workshop Invitees

No	Organization	Work Title	Name	Attended
1	UB City Government	Deputy Governor	B. Baatarzorig	No
2	Mayor's Office	General Manager of Ulaanbaatar City and Chairman of the Governor's Office	G. Munkhbayar	Yes
3		Chief of City Development, Strategic Policy and Planning Department	A. Zulgerel	Yes
4		Specialist of City Development, Strategic Policy and Planning Department	Ch. Batsaikhan	Yes
5	Governor's Office	Head of Public Service Department	Ts. Bold	Yes
6		Officer of Public Service Department	B. Delgerbayar	Yes
7		Officer of Public Service Department	Ch. Badamkhand	Yes
8		Officer of Public Service Department	P. Enkhtuya	Yes
9		Officer of Public Service Department	T. Buyanjargal	Yes
10		Officer of Public Service Department	L. Baatartsogt	Yes
11	Ministry of Infrastructure		Mrs. Oyunchimeg	Yes
12	Ministry of Nature and Environment	Head of Department of Sustainable Development and Environment	B. Bayasgalan	No
13		Head of Strategic Policy and Planning Department	N. Oyundari	No
14		Officer of Department of Sustainable Development and Environment	M. Zoljargal	Yes
15		Senior Officer of Strategic Policy and Planning Department	Sh. Dagva	Yes
16	Ministry of Industry and Trade	Senior Officer of Industrial Policy Adjustment Department	B. Balgansuren	Yes
17	Department of Nature and Environment	Chief	Ch. Dambasuren replaced G. Budragchaa	Yes
18	Ministry of Health	Policy Regulating Department Officer of Public Health Affairs	Sh. Enkhtsetseg	Yes
19	Institute of Urban Planning, Research and Design	Director	G. Bold	Yes
20	City Specialized Inspection Department	Head of Natural and Infrastructure Inspection Division	Ts. Tsengel	Yes
21		State Inspector of Natural and Infrastructure Inspection Division	N. Oyuntsetseg	Yes
22		Head of Public Health Monitoring Department	L. Byambasuren	Yes
23		State Inspector of Public Health Monitoring Department	B. Oyun	Yes
24	Bayanzurkh District Governor's Office	Head of Production, Modernization, and Service Department	Mrs. Battsetseg	Yes
25	Bayangol District Governor's Office	Head of Production, Modernization, and Service Department	Mr. Ulambayar	No
26	Sukhbaatar District Governor's Office	Head of Production, Modernization, and Service Department	G. Oyuntsetseg	Yes
27	Songino Khaikhan District Governor's Office	Head of Production, Modernization, and Service Department	Ts. Nuudel	Yes
28	Khan Uul District Governor's Office	Head of Production, Modernization, and Service Department	Ch. Oyunbaatar	Yes
29	Chingeltei District	Head of Production, Modernization,	Bulgan	Yes

	Governor's Office	and Service Department		
30	Nalaikh District Governor's Office	Head of Production, Modernization, and Service Department	D. Batdorj	Yes
31	Baganuur District Governor's Office	Head of Production, Modernization, and Service Department	Yu. Tsevegjav	Yes
32	"Nuuts" Company Ltd.	Director	B. Naran	Yes
33	Bayanzurkh District Renovation Company	Director	Ts. Tsogtsaikhan	Yes
34	Bayangol District Renovation Company	Director	D. Batsaikhan	Yes
35	Sukhbaatar District Renovation Company	Director	D. Sukhbat replaced Ts. Battuvshin	Yes
36	Songino Khaikhan District Renovation Company	Director	G. Enkhtur replaced R. Dondov	Yes
37	Khan Uul District Renovation Company	Director	P. Ganbaatar	Yes
38	Chingeltei District Renovation Company	Director	Ch. Enkhbold	Yes
39	Nalaikh District Renovation Company	Director	Z. Erdenekhuu	Yes
40	Baganuur District Renovation Company	Director	B. Byambadorj	No
41	"Baigal Erdene San" NGO	Head	N. Sodnompil	Yes
42	"Ariun Orchin" NGO	Head	G. Tsetsegmaa	Yes
43	Community Representative	Citizen	N. Erdenebaatar	No
44	KHUD 12 khoroo Governor's Office	Governor	B. Enkhsaikhan	No
45	KHUD 12 khoroo Governor's Office	Resident (Kheseg Leader)	As appointed	No
46	SKHD 4 khoroo Governor's Office	Governor	D. Ganbold	Yes
47	SKHD 4 khoroo Governor's Office	Resident (Kheseg Leader)	D. Narangerel	Yes
48	SKHD 6 khoroo Governor's Office	Governor	N. Batjargal	Yes
49	SKHD 6 khoroo Governor's Office	Resident (Kheseg Leader)	B. Barduu	No
50	BZD 2 khoroo Governor's Office	Governor	S. Myagmarjav	Yes
51	BZD 2 khoroo Governor's Office	Resident (Kheseg Leader)	Ts. Yura	Yes
52	NAD 3 khoroo Governor's Office	Governor	Sh. Vanganjil	Yes
53	NAD 3 khoroo Governor's Office	Resident (Kheseg Leader)	N. Shijirbaatar	Yes
54	BND 3 Khoroo Governor's Office	Governor	D. Tuya	Yes
55	BND 3 Khoroo Governor's Office	Resident (Kheseg Leader)	Ye. Oyuntsetseg	No

Appendix 2: Workshop Program

Ulaanbaatar Hotel
 2005

April 11,

Topic	Expositor	Time
1. Opening Address by Mongolian Side	MUB and MONE	9:00 – 9:10
2. Opening Address by the Japanese Side	JICA	9.10 – 9:20
3. Explanation of objectives and work procedure of the second workshop	Study Team	9.20 – 10:00
4. Explanation of advantages and disadvantages of six (6) candidates as future disposal site(s)	C/P and Study Team	10:00 – 10:50
Coffee break		10:50 – 11:10
5. Question and answer for the advantages and disadvantages of six (6) candidates	Participants, C/P and Study Team	11:10 – 12:10
6. Discuss and assess the six candidate sites (1)	Participants in 4 Groups (mixed organizations)	12:10 – 13:00
Lunch		13:00 – 14:00
7. Discuss and assess the six candidate sites (2)	Participants in 4 Groups (mixed organizations)	14:00 – 15:10
8. Presentation of the results	Representative from each group	15:10 – 16:10
Coffee break		16:10 – 16:30
9. Roundup of the meeting	C/P and Study Team	16:30 – 17:00

Appendix 3: Opening Addresses

A.3.1. Opening Address by Mr. G. Munkhbayar, General Manager of the City Governor's Office, on behalf of the Municipality

Good morning dear guests and representatives,

On behalf of the presidium of the Capital City's Citizens Representative Khural, Ulaanbaatar City Governor's office, the City Governor and personally, I would like to express my profound gratitude to the JICA Study Team that has been performing a great deal of work within a short period through efficient cooperation with us.

The JICA Study Team has been working in Ulaanbaatar City since the beginning of December, 2004. The Study Team has completed the Waste Amount and Composition Survey for the winter season, Recycling Market Survey, Waste Flow Analysis, Time and Motion Survey and Social Survey and commenced Analysis of the Financial System of SWM in UBC and the technical specifications of the Pilot Project for the improvement of Ulaan Chuluut Final Disposal Site.

The key issue of the SWM of UBC that should necessarily be solved is the optimum location of the future final disposal site. Thus, the objective of this second Workshop is to select the optimum final disposal site.

The Study Team, Mayor's and Governor's offices of UBC and the Ministry of Nature & Environment established a Joint Working Group for the selection of the Final Disposal Site. In consequence of these works, 6 candidate sites have been selected to submit to the Second Workshop and those sites have been visited and reviewed, also environmental and economic surveys have been conducted.

The question of deciding the location of Final Disposal Site is the essential issue of solid waste management, therefore all participants and members invited to this Workshop are kindly requested to take it into your consideration seriously.

I hope that the most optimum decision to decide the location of Final Disposal Site will be made by every effort of participants and I would like to wish good luck for the progress of this Workshop.

Thank you for your kind attention.

A.3.2 Opening address by Mr. Yoshio Kanzaki, JICA Resident Representative in Mongolia, on behalf of JICA

First of all, on behalf of JICA, I would like to thank everybody here and the Ministry of Nature and Environment and the relevant officials of UB Municipality providing tremendous support to the daily activities of the Study for taking your time and participating in this Workshop.

The Study on Solid Waste Management Plan for Ulaanbaatar City, which started its operation in last December, has been implemented under two overall objectives. First is to formulate a Master Plan for solid waste management till the target year of 2020 and the other one is to strengthen human resource related to solid waste management. In terms of activities conducted by JICA in the field of nature and environment, especially on solid waste, this project is the first project and it is understood that the study has been moving forward with its full content as a result of the great initiative and effort of Ulaanbaatar city.

For instance, in the five-months since the study started, opinions and thoughts on waste collection system and techniques of setting amount of collection fee based on implementation and results of the study have been shared in the weekly technical working group meetings in a friendly atmosphere. Moreover, the Steering Committee meeting of 9th of March decided to suggest future landfill selection from six candidate sites and to implement the Pilot Project at Ulaan Chuluut.

Hence, today's Workshop's purpose is to discuss which of the candidate sites are the most appropriate in terms of environment and transport cost. As I mentioned in the beginning of my speech, one of the objectives of the study is to formulate a master plan till 2020. Therefore, in the process of formulating the master plan, it is an important first step to identify the landfill site.

I think it is not excessive to remind that whether the master plan can be formulated or not is highly dependent on today's discussion. Thus, I would like to kindly ask your active participation in order to reach integrated perception and understanding about future landfill site in today's Workshop.

For the further extension of the project, it is intended to ask the Steering Committee to make the final decision about landfill based on today's Workshop's view. Furthermore, I think it's important to inform you that the preparation work of Pilot Project at Ulaan Chuluut has been taking place.

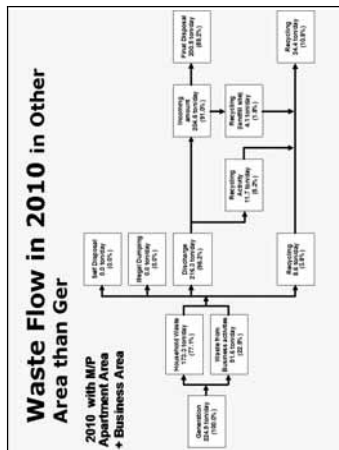
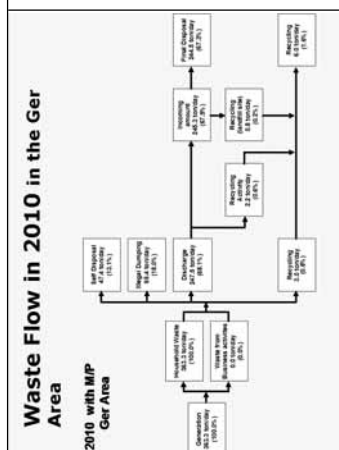
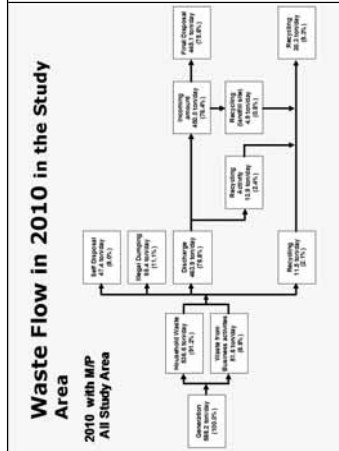
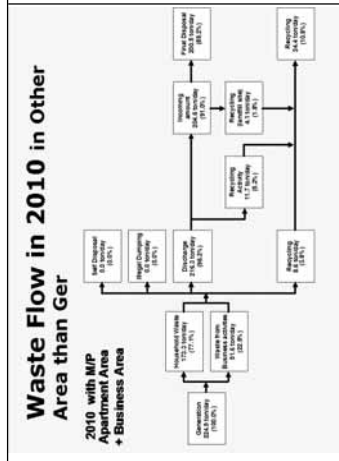
Finally, I would like to end my speech once more requesting you to participate actively in order to make today's Workshop succeed.

Thank you very much.

Appendix 4: Workshop Objective and Procedure

<div>Item 3</div> <div>Objective and Work Procedure of the Second Workshop for THE STUDY ON SOLID WASTE MANAGEMENT PLAN FOR ULAANBAATAR CITY</div> <div>April 11, 2005 Counterparts of the Study and JICA Study Team</div>	<div>Contents of Program 1</div> <div>1. Objectives of the Workshop</div> <div>2. Background</div> <div>3. Work procedure to pursue the objectives</div>	<div>1. Objectives</div> <div>The objectives of the workshop (2) are:</div> <div>1. To understand the needs of siting of future final disposal site(s) for the formulation of the SWM master plan (M/P);</div> <div>2. To examine and discuss advantages and disadvantages of SWM technical system alternatives corresponding to the six candidates for future final disposal site(s); and</div> <div>3. To make recommendation regarding future final disposal site(s) for SWM in the City of Ulaanbaatar.</div>	<div>2. Background</div> <div>2.1 Requirements of a Practical SWM M/P</div> <div>□ The City of Ulaanbaatar is facing serious problems on solid waste management (SWM), such as limited collection coverage, illegal dumping, open dumping at the disposal sites, financial constraint, etc.</div> <div>□ To solve SWM problems it requires not only inputting technical/financial resources but also involvement/cooperation of the public. Because SWM is concerned issues for all citizen.</div> <div>□ Therefore, formulation of a practical SWM M/P requires involvement of concerned people as much as possible.</div>																																																																																																																																																							
			<div>2.3 Formulation of M/P and Alternative Study (1)</div> <div>□ One of the most important issues of the formulation of a SWM M/P is to find out an optimum technical system that creates environmentally sound, socially acceptable & cost minimum SWM.</div> <div>□ To find out the optimum technical system requires an alternative study, i.e. system comparison study.</div> <div>□ A technical system alternative consists of collection, transportation, intermediate treatment and final disposal systems.</div> <div>□ The needs of intermediate treatment facilities will be examined after the selection of proper landfill site(s). Because needs of them highly depend on the location and cost of landfill, and if alternatives include them, it may bring confusion for comparison of each alternative.</div>	<div>2.3 Formulation of M/P and Alternative Study (2)</div> <div>□ Since any SWM technical system needs at least one final disposal site (landfill). For the alternative study candidates of future final disposal site(s) are the critical issue.</div> <div>□ It is essential for the formulation of a practical M/P to obtain consensus among the stakeholders regarding the location of new (future) final disposal sites.</div> <div>□ The Mongolian counterparts (C/P) and JICA Study Team, therefore, agreed to conduct a site selection procedure as open to the public as shown in the next screen.</div>																																																																																																																																																						
	<div>2.2 SWM Technical System (2)</div> <div>□ Needs of an intermediate treatment facility highly depend on the location and cost of landfill.</div> <div>□ Since the public sector should not neglect environmental protection (it costs a lot), no intermediate treatment facility in the world, owned by the public, is being operated without receiving a tipping fee that a user pays for reduction of transportation and landfill costs.</div> <div>□ Profit from sales of by-product (compost, electricity, recyclables, etc.) by the operation of a waste recycling facility can not cover real cost (depreciation + O&M costs).</div> <div>□ The reason why 78% of SW are subject to the incineration in Japan is because landfill price is extremely high (> 300 US\$/ton).</div>		<div>Current and future waste composition – With Ash</div> <table><tr><th>Category of MSW</th><th>2005</th><th>2010</th><th>2015</th><th>2020</th></tr><tr><td>Kitchen Waste (%)</td><td>12.5</td><td>15.5</td><td>19.3</td><td>23.7</td></tr><tr><td>Paper (%)</td><td>5.2</td><td>6.5</td><td>8.1</td><td>10.0</td></tr><tr><td>Textile (%)</td><td>2.0</td><td>2.5</td><td>3.1</td><td>3.8</td></tr><tr><td>Grass and Wood (%)</td><td>0.5</td><td>0.5</td><td>0.5</td><td>0.6</td></tr><tr><td>Plastic (%)</td><td>7.8</td><td>9.8</td><td>12.1</td><td>14.9</td></tr><tr><td>Leather and Rubber (%)</td><td>0.2</td><td>0.3</td><td>0.4</td><td>0.4</td></tr><tr><td>Combinables (%)</td><td>28.2</td><td>35.1</td><td>43.5</td><td>53.4</td></tr><tr><td>Metal (%)</td><td>1.5</td><td>1.9</td><td>2.4</td><td>2.9</td></tr><tr><td>Bottle and Glass (%)</td><td>5.5</td><td>7.1</td><td>8.8</td><td>10.7</td></tr><tr><td>Ceramic and Stone (%)</td><td>1.9</td><td>2.0</td><td>2.1</td><td>2.3</td></tr><tr><td>Miscellaneous (%)</td><td>2.7</td><td>2.8</td><td>3.0</td><td>3.2</td></tr><tr><td>Non-combinables (%)</td><td>11.6</td><td>13.8</td><td>16.3</td><td>19.1</td></tr><tr><td>Other Waste than Ash (%)</td><td>39.8</td><td>48.9</td><td>58.8</td><td>72.5</td></tr><tr><td>Ash (%)</td><td>60.2</td><td>51.1</td><td>40.2</td><td>27.5</td></tr><tr><td>Total</td><td>100.0</td><td>100.0</td><td>100.0</td><td>100.0</td></tr></table>	Category of MSW	2005	2010	2015	2020	Kitchen Waste (%)	12.5	15.5	19.3	23.7	Paper (%)	5.2	6.5	8.1	10.0	Textile (%)	2.0	2.5	3.1	3.8	Grass and Wood (%)	0.5	0.5	0.5	0.6	Plastic (%)	7.8	9.8	12.1	14.9	Leather and Rubber (%)	0.2	0.3	0.4	0.4	Combinables (%)	28.2	35.1	43.5	53.4	Metal (%)	1.5	1.9	2.4	2.9	Bottle and Glass (%)	5.5	7.1	8.8	10.7	Ceramic and Stone (%)	1.9	2.0	2.1	2.3	Miscellaneous (%)	2.7	2.8	3.0	3.2	Non-combinables (%)	11.6	13.8	16.3	19.1	Other Waste than Ash (%)	39.8	48.9	58.8	72.5	Ash (%)	60.2	51.1	40.2	27.5	Total	100.0	100.0	100.0	100.0	<div>Current and future waste composition – Without Ash</div> <table><tr><th>Category of MSW</th><th>2005</th><th>2010</th><th>2015</th><th>2020</th></tr><tr><td>Kitchen Waste</td><td>31.4</td><td>31.8</td><td>32.3</td><td>32.7</td></tr><tr><td>Paper</td><td>13.1</td><td>13.4</td><td>13.6</td><td>13.9</td></tr><tr><td>Textile</td><td>3.0</td><td>3.2</td><td>3.2</td><td>3.3</td></tr><tr><td>Grass and Wood</td><td>1.2</td><td>1.1</td><td>0.9</td><td>0.8</td></tr><tr><td>Plastic</td><td>19.5</td><td>19.8</td><td>20.2</td><td>20.5</td></tr><tr><td>Leather and Rubber</td><td>0.6</td><td>0.6</td><td>0.6</td><td>0.6</td></tr><tr><td>Combinables Sub-Total</td><td>70.8</td><td>71.9</td><td>72.8</td><td>73.7</td></tr><tr><td>Metal</td><td>3.8</td><td>3.9</td><td>3.9</td><td>4.0</td></tr><tr><td>Bottle and Glass</td><td>14.0</td><td>14.3</td><td>14.6</td><td>14.7</td></tr><tr><td>Ceramic and Stone</td><td>4.7</td><td>4.1</td><td>3.6</td><td>3.1</td></tr><tr><td>Miscellaneous</td><td>8.7</td><td>8.8</td><td>5.1</td><td>4.5</td></tr><tr><td>Non-combinables Sub-Total</td><td>28.2</td><td>28.1</td><td>27.2</td><td>26.3</td></tr><tr><td>Total</td><td>100.0</td><td>100.0</td><td>100.0</td><td>100.0</td></tr></table>	Category of MSW	2005	2010	2015	2020	Kitchen Waste	31.4	31.8	32.3	32.7	Paper	13.1	13.4	13.6	13.9	Textile	3.0	3.2	3.2	3.3	Grass and Wood	1.2	1.1	0.9	0.8	Plastic	19.5	19.8	20.2	20.5	Leather and Rubber	0.6	0.6	0.6	0.6	Combinables Sub-Total	70.8	71.9	72.8	73.7	Metal	3.8	3.9	3.9	4.0	Bottle and Glass	14.0	14.3	14.6	14.7	Ceramic and Stone	4.7	4.1	3.6	3.1	Miscellaneous	8.7	8.8	5.1	4.5	Non-combinables Sub-Total	28.2	28.1	27.2	26.3	Total	100.0	100.0	100.0	100.0
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<div>2.2 SWM Technical System (1)</div> <div>□ SW (solid waste) could be managed by only collection and final disposal (landfill) systems.</div> <div>□ An intermediate treatment (processing including recycling) is the system between the collection and final disposal (landfill) systems and it is not always necessary for MSWM.</div> <div><div>Collection</div><div>Intermediate Treatment</div><div>Final Disposal</div></div>	<div>2.3 Formulation of M/P and Alternative Study (3)</div> <div><div>Presentation of Candidate Sites</div><div>Mongolian Counterpart</div><div>JICA Study Team</div><div>Preparation and Comparison of Alternatives according to the Candidate Sites for Future Disposal</div><div>Preliminary discussion for selection of Optimum Alternative</div><div>2nd Workshop</div><div>3rd Steering Committee</div><div>Selection of Optimum Alternative and Final DS</div><div>Public Information</div><div>1st Seminar</div></div>																																																																																																																																																									

<div>Comparison of waste composition</div> <table><thead><tr><th>Country/City</th><th>Year</th><th>GDP per capita (US\$)</th><th>Kitchen Waste (%)</th><th>Papers + Plastics (%)</th><th>Metal, Bottle and Glass (%)</th></tr></thead><tbody><tr><td>Tokyo in Japan</td><td>1984</td><td>31,981</td><td>25.1</td><td>50.9</td><td>11.9</td></tr><tr><td>Vientiane Lao</td><td>1991</td><td>290</td><td>35.1</td><td>16.3</td><td>8.9</td></tr><tr><td>Phnom Penh</td><td>2003</td><td>268</td><td>63.5</td><td>21.9</td><td>1.9</td></tr><tr><td>Dar es Salaam Tanzania</td><td>1996</td><td>280</td><td>45.0</td><td>6.1</td><td>4.6</td></tr><tr><td>Asuncion Paraguay</td><td>1994</td><td>1,450</td><td>37.4</td><td>14.4</td><td>4.8</td></tr><tr><td>Metro Manila Philippines</td><td>1997</td><td>1,040</td><td>45.4</td><td>32.4</td><td>8.6</td></tr><tr><td>Adana Turkey</td><td>1999</td><td>3,090</td><td>64.4</td><td>20.3</td><td>4.5</td></tr><tr><td>Mexico Mexico</td><td>1998</td><td>5,090</td><td>38.7</td><td>34.6</td><td>NA</td></tr><tr><td>Ulaanbaatar with Ash</td><td>2003</td><td>552</td><td>12.5</td><td>13.0</td><td>7.0</td></tr><tr><td>Ulaanbaatar without Ash</td><td>2003</td><td>552</td><td>31.4</td><td>32.6</td><td>17.8</td></tr></tbody></table>	Country/City	Year	GDP per capita (US\$)	Kitchen Waste (%)	Papers + Plastics (%)	Metal, Bottle and Glass (%)	Tokyo in Japan	1984	31,981	25.1	50.9	11.9	Vientiane Lao	1991	290	35.1	16.3	8.9	Phnom Penh	2003	268	63.5	21.9	1.9	Dar es Salaam Tanzania	1996	280	45.0	6.1	4.6	Asuncion Paraguay	1994	1,450	37.4	14.4	4.8	Metro Manila Philippines	1997	1,040	45.4	32.4	8.6	Adana Turkey	1999	3,090	64.4	20.3	4.5	Mexico Mexico	1998	5,090	38.7	34.6	NA	Ulaanbaatar with Ash	2003	552	12.5	13.0	7.0	Ulaanbaatar without Ash	2003	552	31.4	32.6	17.8	<div><div>2.4 Important issues for the examination of possible intermediate treatment system (2)</div><div>2. Needs of product & by-product (recycled) and recovered items by treatment)</div><div><div>For recycling, demands of product/by-product and supply of wastes as raw materials are critical.</div><div>Small demand of compost => cow dung is disposed of at Khan-Uul District dump site with tipping fee</div><div>Large demand of fuel for heating plants and power generation plants => Thermal recycling of waste is prospective</div><div>Regarding scale of the in the country final users of reuse & recyclable materials from SW (paper, plastics, metals, bottles/glass) for a sorting facility will be limited.</div></div></div>	<div><div>Cow dung is disposed of at Khan-Uul District dump site with tipping fee</div><div>Cow dung is much better organic fertilizer/soil conditioner than compost made from solid waste</div><div></div></div>	<div><div>Thermal Recycling by RDF = Refuse Derived Fuel</div><div>RDF is made from SW of higher calorific value; i.e. paper and plastics, 5,000 and 8,000 kcal/kg (coal 3,200 kcal/kg). The important issues for RDF are i. Separation of such wastes, ii. Costs of separate collection, iii. Air pollution measures and cost.</div><div></div></div>
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	<div><div>2.4 Important issues for the examination of possible intermediate treatment system (3)</div><div>3. Important issues from current recycling categories</div><div><div>Limited final users in terms of capacity and categories</div><div>Most of recyclables are transported to China => huge transportation cost</div><div>Current final users in UBC limit generation sources of recyclable wastes. Because materials of high quality should be pure and clean as much as possible.</div><div>If a recycling facility will not limit its sources of wastes, it will not be profitable due to cleaning and purification processes and costs. => At present final users in UBC face to the difficulty in supply of suitable waste.</div></div></div>	<div><div>Final users in UBC: Plastic</div><div><div>Raw waste</div><div>Melting and Production of Pellets</div><div>Production of Plastic Bags</div></div><div></div><div>The wastes of raw materials for the production of plastic pellets come from factories, supermarkets, etc. The wastes are already segregated at the generations. Even though quality (no contaminant one) of products are limited to.</div></div>	<div><div>2.4 Important issues for the examination of possible intermediate treatment system (4)</div><div>4. Important issues from other countries</div><div><div>Problems of recycling of MSW (municipal solid waste) are mixture of various materials and contamination of each others.</div><div>Although 84.9% of MSW in Japan are treated by some facilities, the recycling rate is only 13.0% in total. Final disposal rate in weight is 20.1%.</div><div>On the other hand, the recycling rate of factory waste of Bangkok in Thailand is 78.4% (42% in Japan). This is mainly because factory waste of production process is pure in quality and large in quantity that facilitates recycling.</div></div></div>																																																																		
<div><div>Sorting of Recyclables</div><div><div>System in Japan: The manual sorting is the most effective method. The sorting for MSWM does not make any profit.</div><div>System in Mexico: Municipality subsidizes the plant operation costs. It is for the purpose of removing waste pickers from sanitary landfill.</div></div><div></div></div>																																																																					



3. Introduction of Candidate Sites : Examination of Alternatives

Alternative (Site)	System
Alt 1 NEDS	6 Districts → NEDS Nalaikh District → NCMDS
Alt 2 XMKDS	6 Districts → XMKDS Nalaikh District → NCMDS
Alt 3 MDOS	6 Districts → T/S → MDOS Nalaikh District → NCMDS
Alt 4 TDOS	6 Districts → TDOS Nalaikh District → NCMDS
Alt 5 BKOS	6 Districts → T/S → BKOS Nalaikh District → NCMDS
Alt 6 BCMDOS	6 Districts → T/S → Railway → T/S → BCMDOS Nalaikh District → NCMDS



4. Environmental issues

1. Current photo of each site
2. In order to evaluate environmental aspects of the candidate sites a preliminary environmental study was conducted by the National University based on the following survey:
 - Field reconnaissance to the six candidate sites; and
 - Literature study including collection of available data such as topographic maps, geological profile, etc.
3. Environmental evaluation was made on social aspects, natural environment and pollution



Theme	MEQ3	MEQ20	MEQ25
1. Location	Site (Pitaka, Phonsi 4) Area 2,220 ha, Population 1,179 Population density 0.530 No specific activities in total land in the site.	Site (Pitaka, Phonsi 2) Area 10,792 ha, Population 11,179 Population density 1.036 No specific activities within 10 m.	Site (Pitaka, Phonsi 12) Area 10,792 ha, Population 4,319 Population density 0.401 No specific activities within 10 m.
2. Habitats			
3. Economic Activities	No specific activities recorded for grazing.	No specific activities recorded for grazing.	No specific activities recorded for grazing.
4. Traffic and Public Facilities (PF)	Medium to heavy traffic volume of 8m of 3 km. A high school, a residential locality in the center of Phonsi.	Large traffic volume of 10m of 11 km. Locality of a high school, a kindergarten and a hospital located in the center of Phonsi.	Large traffic volume of 10m of 32m. Locality of a high school, a kindergarten and a hospital located in the center of Phonsi.
5. Cultural Property (CP)	No CP within 4 km	No CP within 4 km	No CP within 4 km
6. Public Health Condition	Possibility of some disease caused by the MEQ20	No specific disease	Possibility of some disease caused by the MEQ20.

Item	UDC	EDC	BCDC
1. Location	B7 District, Khomo 21 Area 25,412 km ² , Population 27,600 No. of villages 10	No District, Khomo 1 Area 5,700 km ² , Population 10,000 No. of villages 10	BN District, Khomo 20 Area 10,000 km ² , Population 12,000 No. of villages 10
2. Inhabitants	No. of inhabitants within 1 km. No. of inhabitants within 2 km.	No. of inhabitants within 1 km No. of inhabitants within 2 km.	No. of inhabitants within 1 km. No. of inhabitants within 2 km.
3. Economic Activities	3 brick manufacturing factories with license No. of brick manufacturing factories between 1.2 and 1.9 No. of brick manufacturing factories between 2.0 and 2.9	Department for Protection from Air Pollution No. of brick manufacturing factories between 1.2 and 1.9 No. of brick manufacturing factories between 2.0 and 2.9	The site includes waste of currently operating brick manufacturing plants Coordination of brick manufacturing plants No. of brick manufacturing factories between 1.2 and 1.9 No. of brick manufacturing factories between 2.0 and 2.9
4. Traffic and Public Facilities	Medium 12 heavy traffic volume of the city, 100 km from the city. A hospital located in the center of the town.	Medium to light traffic volume of the city, 100 km from the city. No PF within 3.2 km	Revised 130 km from the center of UDC, 100 km from the center of BDC, 120 km and 5 - 6 schools and a hospital, 100 km from the center of District.
5. Cultural Property	No CP within 4 km	No CP within 4 km	No CP within 4 km.
6. Public Health Condition	Probability of some specific diseases (HIV, malaria, tuberculosis, etc.) previous than 10% D5.	No specific disease.	Frost and mouth disease through cattle.

Items	NEEDS	NRD25	NRD25
7. Topography and Geology	A mountain valley. Mainly consists of clay soils.	Originally granite hill changed to a big hole. Mainly consists of clay soils.	A small valley valley. Mainly consists of sandy soils.
8. Grasshopper	4 weeks in 2.0 - 3 km from sandy hill to run suitably for sanitary requirement.	Because of clayey soil and the grasshopper might be less.	Direction of flow is from the Tsal river, the Tsal river.
9. Hydrological situation	Nearest river is Dam	2.0 km from Tsal river, Tsal river.	Item from Tsal river of dam for drinking.
10. Fauna and flora	No important or rare species registered.	Hard to grow and live due to soil	Important or rare have been found in 0.5 km radius.
11. Meteorology	Need to protect the site from strong wind	Less impacts by wind due to a deep hole.	Less impacts by wind due to mountain wind direction.
12. Landscape	Thought on specific property, it may effect natural area.	Less impacts on landscape because of a deep hole.	Less impacts on landscape because of current. NRD25

[illegible]

Items	NEOS	XMKOS	MOOS
13. Air Pollution	Impacts of odor and dust will not be as great as in populated areas.	Odor and dust will affect populated area.	Impacts of odor and dust will not be as great as in populated areas.
14. Water Pollution	Possibility of polluting wells and the source of the flow direction is north to south.	Possibility of polluting wells nearby the site.	Possibility of polluting surface and groundwater nearby the site. The main water supply consists of many small water supply.
15. Noise and Vibration	Population area due to less impact.	Noise and vibration will affect populated area.	Population area due to less impact.
16. Others	The rapid growth of Gori area may cause to increase in noise and vibration.	Location of the site is not far from "Household and Industrial Waste" treatment.	Impacts to the small area will be examined.

Items	TDOS	BCOS	BCIDS
13. Air Pollution	Less impacts of odor except for workers in factory manufacturing	Less impacts of odor except for workers in air strike	Less impacts of odor except for workers in the coal mine.
14. Water Pollution	Possibility of polluting surface and ground water, and out side of down stream of the site.	Possibility of polluting surface and ground water.	High possibility of pollution due to surface and ground water which are other than hydraulic system.
15. Noise and Vibration	Less impacts except for 3 brick manufacturing factories	Less impacts workers of anti-strike base	Less impacts than mining operation.
16. Others	The rapid expansion close to the site in near future may violate the Law of Hazardous and Polluted Land Control.	Difficult to get the anti-air strike base	Location of the site of "Hazardous and Industrial Waste" suitable with railway and mining operation.


- ❑ Conditions for costing
- 1. General
- 2. Collection and transportation system
- 3. Final disposal system

- Costing based on the waste amount in 2010
464 ton /day
- One Transfer Station is required when disposed to BKS
- Wastes will be transported to Baganuur by Train, so no need to construct a transfer station. Wastes will be unloading transfer station. 23 wagons will be purchased to transport wastes by Train
- Both of them are assumed to be constructed in 2010
- Nalakh District will dispose to his own disposal site (NCMDs), which is former coal mining pit, except disposing to the BKDS together with wastes from Nalakh District
- Indirect cost is considered for collection and transportation services i.e. 35% of direct cost

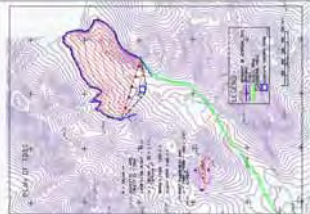
Disposal Site	NEOS	TDOS	XHOS	MDOS	BKOS	BCHOS
Relay						
1st	11.7	12.8	8.3	24.0	11.3	11.3
2nd	-	-	-	-	30.7	128.4
Bayangol						
1st	17.9	10.7	14.5	25.3	5.3	5.3
2nd	-	-	-	-	30.7	128.4
Bayanuruth						
1st	2.0	2.0	2.0	2.0	8.0	2.0
2nd	-	-	-	-	-	-
Maahik						
1st	7.3	20.1	1.0	21.2	18.7	18.7
2nd	-	-	-	-	30.7	128.4
Shang						
1st	18.1	8.0	15.4	27.0	10.4	10.4
2nd	-	-	-	-	30.7	128.4
Subkhasar						
1st	15.6	9.7	12.2	35.0	10.9	10.9
2nd	-	-	-	-	30.7	128.4
Chigared						
1st	14.8	17.3	11.4	15.0	15.7	15.7
2nd	-	-	-	-	30.7	128.4
Khan Gul						
1st	-	-	-	-	-	-
2nd	-	-	-	-	30.7	128.4

Note: Nalalikh will utilize his own disposal site which is abandoned coal mining pit except transporting to the New BKDS disposal site.

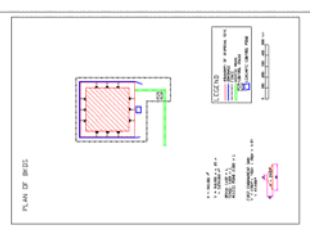
Preliminary development plan of MDDS



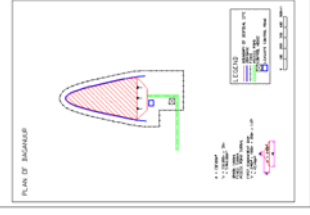
Preliminary development plan of TDOS



Preliminary development plan of BKDS



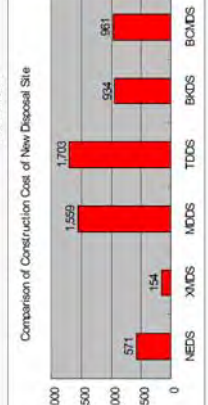
Preliminary development plan of BCMDS



Particulars of Each Disposal Site							
Description	Unit	NEDS	XNDS	MDOS	TDOS	BKDS	BCMDS
Area	ha	30	7	25	31	16	14
Landfill Capacity	m3	3,097,000	447,000	3,660,000	3,370,000	3,390,000	3,960,000
	ton	2,054,000	331,000	2,712,000	2,640,000	2,671,000	2,704,000
Expected Service Life	year	16	2	15	14	13	16

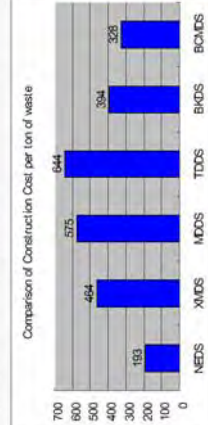
Comparison of Construction Cost

Million MNT



Comparison of Construction Cost per ton of Waste

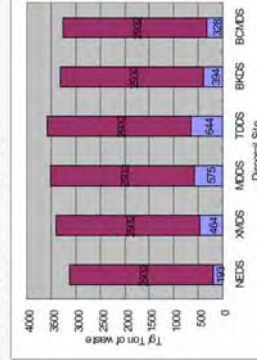
MNT/ton



Monthly Operation Cost of Sanitary Landfill			Remarks
1. Planning Daily Operation	180,000	Planner	
2. Sanitary Landfilling Operation	37,908,000	Bulldozer, Excavator, Dump truck, Water Truck, Supervision, Control Traffic, Control Waste Pile	
3. Collection Control	1,116,000	Weightbridge Operation, Analysis of Data, Education, Reducing Illegal Dump	
4. Monitoring/Safety Control	54,000	Monitoring Committee, Safety Control	
Sub Total	39,258,000		
Operation Cost per ton of wastes	2,932 Tg/ton		Final Disposal Amount in 2010 = 11,333 ton/month

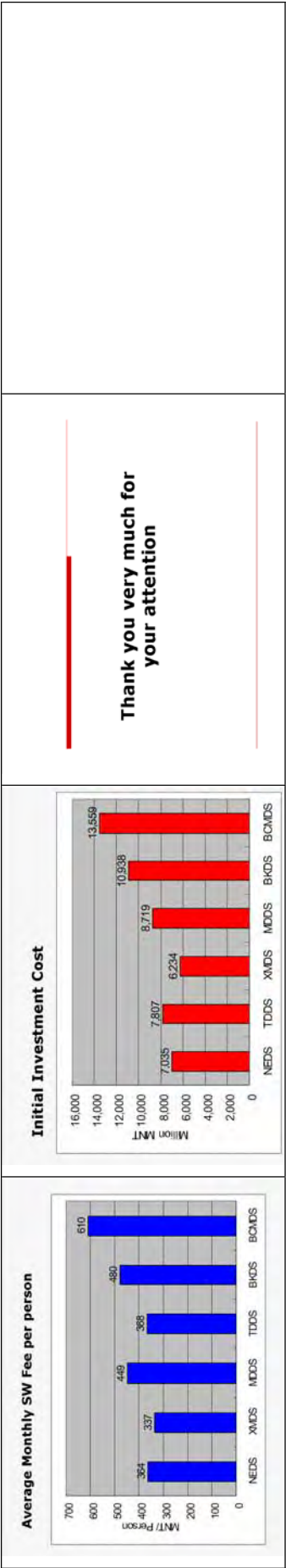
Comparison of Construction and Operation Cost per ton of Waste

MNT/ton



Summary of financial analysis (1)							
Items	Unit	NEDS	XNDS	MDOS	TDOS	BKDS	BCMDS
1. Collection and Transportation Cost	MNT/ton	15,364	13,227	19,323			
2. Final Disposal Cost	MNT/ton	3,125	3,396	3,507			
3. 1+2	MNT/ton	18,489	17,123	22,830			
4. Administration Cost	MNT/ton	1,849	1,712	2,283			
5. Total Cost	MNT/ton	20,338	18,835	25,113			
6. Waste Generation per Person in 2010	kg/day	0.596	0.596	0.596			
7. Average Collection Fee per Person Household	MNT/month	364	337	449			
8. Average Collection Fee per Household	MNT/month	1,536	1,515	2,021			
9. Initial Investment	Million MNT	7,035	6,234	8,719			
10. Total Annual Cost in 2010	Million MNT	4,974	4,595	5,961			

Summary of financial analysis (2)							
Items	Unit	TDOS	BKDS	BCMDS			
1. Collection and Transportation Cost	MNT/ton	15,123	21,058	27,767			
2. Final Disposal Cost	MNT/ton	3,576	3,326	3,260			
3. 1+2	MNT/ton	18,699	24,384	31,027			
4. Administration Cost	MNT/ton	1,870	2,438	3,103			
5. SWM Unit Cost 2010	MNT/ton	20,569	26,822	34,130			
6. Waste Generation per Person in 2010	kg/day	0.596	0.596	0.596			
7. Average Collection Fee per Person Household	MNT/month	368	480	610			
8. Average Collection Fee per Household	MNT/month	1,655	2,158	2,746			
9. Initial Investment	Million MNT	7,607	10,938	13,559			
10. Total Annual Cost in 2010	Million MNT	4,997	6,199	7,857			



Appendix 6: Participant's Questions, Answers and Comments

A6.1. Questions and Answers on the Alternative Sites

1. Senior Expert of Strategic Planning and Policy Regulating Department, Ministry of Nature and Environment Sh. Dagva:

I would like to ask about the high calorific waste especially: bone waste is not mentioned in your waste composition as I understand?

The Study Team Leader Mr. Shimura responded: Bone waste is included in kitchen waste.

2. The Governor of Khoroo No.4 Songino Khaikhan District, T.Ganbold:

First of all, I would like to express my gratitude to the JICA Study team for performing a lot of work in a short period of time. The Ulaan Chuluut and Narangiin Enger disposal sites are within Khoroo No.4 of Songino Khaikhan District. Whilst the Pilot Project for the improvement of Ulaan Chuluut Disposal Site will be implemented there will be lots of waste pickers at the site, thus we may need to restrain them otherwise disorderly conditions will occur. Eventually, I would like to request the Study Team to cooperate with our Khoroo authority to limit the waste pickers entering the disposal site during the progress of Pilot Project, as it is an essential issue.

The Study Team Leader Mr. Shimura responded: We are going to construct an access road during the Pilot Project and additionally instruct the drivers of waste collection trucks throughout the Pilot Project on where the wastes will be disposed. We will also make a schedule for drivers offloading within our control area e.g. between 8 to 9 am in one place and between 10-11 am in another etc. We are going to have an interview survey with the waste pickers prior to the Pilot Project in order to begin to secure their cooperation.

Officer of Public Service Department, Governor's Office of Ulaanbaatar City B.Delgerbayar added that: The interview survey with waste pickers will be conducted on 18-19 April, 2005. We have received a proposal to cooperate with the project on "Improvements for Waste Pickers" jointly funded by Initiative of sustainable countries, Canadian Fund and UNDP to take action for the following:

- i) how to stop waste picking, which way is the best
- ii) to include the waste pickers in vaccination and
- iii) to register the waste pickers etc.

3. Expert of City Development, Strategic Policy and Planning Department, Mayor's Office of Ulaanbaatar City, Ch. Batsaikhan: Could you kindly clarify that what kinds of works can be done for the future final disposal site?.

The Study Team Leader Mr. Shimura responded:

- i) A cut-off drain (drainage system) will be provided to protect the embankment against run-off and flood. And fencing will be provided on the embankment in order to avoid the waste being scattered by wind.
- ii) The embankment will be constructed at the lowest level of the valley so that the waste can be disposed from bottom to top not like the current condition which is from top to bottom. A leachate facility will also be provided.
- iii) A paved access road to the final disposal site will be constructed.

- iv) A weighbridge will be installed at the entrance of the Ulaan Chuluut Disposal Site. A control building will also built.
- v) The power supply to control building will be taken from high voltage lines through a transformer around 1 km from the disposal site. Generally, the most important requirement for the future final disposal site is to compact the waste daily. We have estimated in a budget for the “Improvement of Ulaan Chuluut Disposal Site” that 1 bulldozer will be working for 8 hours and 300 liters of diesel will be consumed a day.

Officer of Public Service Department, Governor’s Office UBC, Mongolia B. Delgerbayar added: The current charge for compacting 1m³ of waste is MNT100 however, the Governor’s Office plans to increase this to MNT300.

4. **Head of City Renovation and Service Department of Khan-Uul District, Governor’s Office, Ch. Oyunbaatar:** I would like to ask you the radius of final disposal site how many meters is it? I think a forest wind-screen (buffer zone) should be established as in other countries that were shown on the presentation. In my opinion a forest zone should be established considering the wind direction, wind power, annual wind velocity and the area etc. Did you estimate the above characteristics in your survey? Eventually, I would like to know the radius of the landfill area.

The Study Team Leader Mr. Shimura responded that a wind-screen (forest zone) is unlikely to be effective in Mongolia because the ecology is generally unsuitable for strong trees with thick foliage.

Professor of Mongolian National State University, Mr. Gonchigsumlaa added that: I have been working in collaboration with JICA Study team closely since last autumn and I deem the survey was conducted accurately. You are right to prefer to select and set up a future final disposal site in a less windy area. However, in general Ulaanbaatar City is a windy area. To find a less windy area in Ulaanbaatar is not possible. The 6 candidate sites all belong to windy areas therefore, the only way to protect against wind is to build a fence around the disposal site. The forest zones provided in other countries, as I have seen in other countries’ experiences, may be established in Mongolia. The windy season in Mongolia is March, April, May, August, September and October.

Officer of Public Service Department, Governor’s Office UBC, Mongolia B. Delgerbayar added: I will give a brief explanation for the radius of the disposal sites. The cut-off drain of the landfill area is 3 km and the area is 30 ha. The radius of Narangiin Enger Disposal Site is 3 km, XMK-2 km, Narandavaa -3 km, Baganuur - 3 km, Tsagaan Davaa 3.2 km and Nalaikh- 3 km.

5. **Head of City Development Policy and Planning Department, Mayor’s Office of Ulaanbaatar city, A. Zulgerel:** I would like to express my gratitude to the JICA Study team that has performed a lot of work within a short period of time. Could you kindly inform me how many households with cattle herds there are around the future final disposal site? Construction wastes will be generated in July 2005 – is the amount of construction waste included in your waste composition survey?

The Study Team Leader Mr. Shimura replied that: Construction waste is a complicated problem. Currently, the construction waste is being illegally dumped everywhere and there should be a plan of how much of construction waste will be generated upon demolishing the buildings in Ulaanbaatar in the City Development Plan. If you have estimated such a plan we will certainly include that amount in our waste composition estimation.

Professor of Mongolian National State University, Mr. Gonchigsumlaa answered that to engage in cattle breeding in a city settlement area is prohibited thus, we should discuss it with the local authorities.

Officer of Public Service Department, Governor's Office UBC, Mongolia B. Delgerbayar replied that the number of livestock has been decreasing year by year in accordance with livestock census. There is an existing borrow pit located at 50-60m adjacent to Narangiin Enger Disposal Site.

6. **Officer of Industrial Policy Regulating Department, Ministry of Industry and Trade, Ya. Balgansuren:** How many disposal sites will be used for how long? The wastes which are generated by factories are pure wastes in consequence of this a waste recycling factory will be definitely discussed. On the other hand, we may use the construction waste to use as a soil covering material.

The Study Team Leader Mr. Shimura stated that we may use a construction waste such as concrete slabs and brick as materials for building the access road which will be constructed in the disposal site.

Head of Public Service Department, Governor's Office of Ulaanbaatar city, Ts. Bold said that we should select 3 candidate sites out of 6 candidate site then those selected 3 candidate sites should be submitted to the Steering Committee meeting to be discussed finally.

7. **Senior Expert of Strategic Planning and Policy Regulating Department, Ministry of Nature and Environment, Sh. Dagva:** Industrial wastes have been classified as hazardous and non-hazardous. We should discuss the hazardous waste separately from non hazardous waste. Today, we can discuss only non hazardous waste which has been generated by factories. There is a list of hazardous industrial waste therefore we can discuss industrial hazardous waste at a later time.
8. **Department of Construction and Public Utilities, Ministry of Construction and Urban Development, B. Oyunchimeg:** First of all, I would like to express my gratitude to the JICA Study Team and Governor's office for organizing this Workshop. As I understand, the Initial Cost requirement for weighbridge in Narangiin Enger Disposal Site is zero thus, could you kindly explain the reason why this cost is zero please?

The Study Team Leader Mr. Shimura replied: You asked a very good question. We have already budgeted a cost for the weighbridge to be installed at the entrance of Ulaan Chuluut Disposal Site in accordance with the Pilot Project for the improvement of Ulaan Chuluut Disposal Site. However, the Narangiin Enger Disposal Site is located only a little beyond Ulaan Chuluut Disposal Site in other words, these disposal sites are located on either side of a hill. In this regard, if the Narangiin Enger Disposal Site will be selected as the optimum candidate site we will construct the road from weighbridge of Ulaan Chuluut Disposal site to Narangiin Enger. Thus we can use the weighbridge of Ulaan Chuluut Disposal site in Narangiin Enger; and therefore budgeted the initial cost requirement for Narangiin Enger Disposal Site as zero.

9. **Head of Modernization, Production and Service Department of Governor's office, Songino Khaikhan District, Nudes:** At present, the wastes collected from six districts of Ulaanbaatar city are being disposed at Ulaan Chuluut Disposal Site, Songino Khaikhan District. Khoroo No.6 is the nearest area to Ulaan Chuluut Disposal Site thus the local residents are always complaining about the dust and waste which has been scattered by wind everywhere. Especially the wastes carried in open waste collection truck is always scattered along the road as they do not have a covering and the more the

waste collection trucks pass along the road to the Disposal Site to unload their waste the more dust will be created in Khoroo No.6. Therefore, I would like to find out if this question is already included in your study or not?

The Study Team Mr. Shimura replied: We have already conducted a Time and Motion Survey at Ulaan Chuluut Disposal Site and found that the coverings for open waste collection trucks were mostly as required. However, for the problem of dust in Khoroo No.6, we are going to construct a paved road from the asphalt road to Ulaan Chuluut Disposal Site. Then we will install the weigh bridge and could use that facility in Narangiin Enger Disposal Site as well, in which case we will also construct the road from Ulaan Chuluut Disposal Site to Narangiin Enger Disposal Site.

10. **Policy Regulating Department Officer of Public Health Affairs, Ministry of Health, Mongolia, Sh. Enkhtsetseg:** I want to ask you about regarding hazardous gas. Did you conduct any survey or analysis of hazardous gas? You have mentioned before that 300 liters of diesel will be consumed for 1 bulldozer to be operated for 8 hours a day which means in some way that environmental pollution will occur during the Pilot Project. So, I think that you have to consider about the air pollution that might effect residents living near the disposal site. I have another question - did you estimate the medical wastes to be disposed at the disposal site? Where will the medical wastes will be disposed?

The Study Team Leader Mr. Shimura replied: Hazardous gas will be generated by the waste. In other words, it discharges hazardous gases such as SO₃, and methane. To solve the problem of these hazardous gases we are going to install a hazardous gas releasing facility. Only three bulldozers will be operated at the Disposal Site thus, I hope there would not be much problem of emitting smoke. As you know well, large numbers of heavy equipment such as bulldozers, excavators, rollers and graders works at road construction at the same time. Regarding medical waste: this occupies only some 0.2 % of total domestic waste. I think the amount of medical waste being generated is quite small.

11. **Head of Bayanzurkh District Renovation Company, D. Batsaikhan:** I think Bayanzurkh District is the farthest district from the disposal site. I have seen the table of haulage costs per ton of waste by tipper truck MNT/ton. The distance from Bayanzurkh district to the Disposal Site is indicated as being closer than Sukhbaatar District. Thus did you calculate the distance of transportation from Bayanzurkh district to disposal site correctly?

Head of Public Service Department, Governor's Office of Ulaanbaatar city, Ts. Bold answered that a Time and Motion Survey was conducted by the JICA Study Team and Study Team Member Mr. Doi Akira accompanied the waste collection trucks of Bayanzurkh and Chingeltei districts. The average distance from Bayanzurkh District to the Disposal Site was 19 km. This is the figure that we have taken as being representative - if we selected a point in Uliastai to Disposal Site then certainly the distance will be increased a lot. Additionally, the roads of Bayanzurkh District apartment area are straight and smooth therefore, the speedometer of the compactor was not over-running, and the compactor was easily filled up collecting the wastes from the dust chutes of the apartment area. Then compactor goes only on a straight road. Thus, the distance was not as far as Sukhbaatar district. The road from Sukhbaatar district to the disposal site is bumpy and circuitous. In consequence of this, the distance of Sukhbaatar District is higher than Bayanzurkh District.

12. **State Inspector of Public Health Monitoring Department, City Specialized Inspection Agency, Oyun:** I have a few questions to ask.

- i) Could you kindly inform me the capacity of the leachate facility and what kinds of measures will be taken when this facility will be filled up?
- ii) Where analysis of the water sample taken from the well water in Narangiin Enger Disposal Site was conducted?
- iii) How did you calculate the loading capacity to dump the waste in the waste collection truck?

Officer of Public Service Department, Governor's Office UBC, Mongolia B. Delgerbayar stated: When we calculated the loading capacity to dump waste we considered the specific gravity of waste. In other words, there is 300-400 kg of waste for 1m³ of waste depending on its specific gravity. Currently, the ZIL-130 open waste collection truck is being loaded with 3.2 tons of waste.

The Study Team Leader Mr. Shimura added: We have estimated the leachate capacity as 1,300 m². The annual precipitation in Mongolia is 300-400 mm and evaporation is high due to the dry weather. Thus, according to my calculation leachate is unlikely be generated in a future disposal site unless heavy rain and flood occurs. We will calculate how much leachate will be generated in a future disposal site. As we have calculated the domestic wastes to be disposed at the site, ash occupies 60% and kitchen waste only 10%. Another question is the sanitary zone of disposal site. I think the Governor's office of Ulaanbaatar City should apply an official request that no building should be constructed in this zone. A sanitary zone should be established around the disposal site to prevent incursion from expanding ger areas. The analysis of well water was conducted by the Mongolian National State University. Before Mr. Gonchigsumlaa gives a detailed explanation of water results, I would like to tell you one thing about smoke caused by fire in Ulaan Chuluut Disposal Site: it is easy to solve the problem of fire at the disposal site if you compact the waste and cover it by soil daily - the fire will not occur again.

Professor of Mongolian National State University, Mr. Gonchigsumlaa added: There are a few farm wells which used by local residents to provide some water for domestic use on the south side of Ulaan Chuluut Disposal Site. Some of the wells were registered and some of them were not, and we have selected 4 wells. Almost as in the center of Ulaanbaatar where lots of population live they have established a well not appropriate hygienically; anyhow we conducted the water assay. I mean we have conducted a water assay analysis at a well which was hygienically in a bad condition. We have tested the hardness of water and whether this water is potable. We conducted chemical and microbiological analysis on the sample taken from the well. That this water was contaminated microbiologically was clear as a water assay result. Moreover we did monitoring to assess if it will effect ground water or not, and the result shows it may effect.

The Study Team Leader Mr. Shimura added: I will give you some information on fire prevention that can occur at disposal site in the case of Adana city, Turkey and what kinds of proper action to be taken to avoid the fire causes. The population of Adana city was 1.2 million which is perhaps 1.5 times more than Ulaanbaatar city population. The total area of the disposal site was 23 ha and the wastes were burning in whole area of the disposal site. By taking only the action of covering by soil we stopped the fire at disposal site. Thank you for your kind attention.

A.6.2 Group Evaluation of Candidate Sites

1. Group "A" Spokesperson: Mr. Dagva, Senior Expert of Strategic Planning and Policy Regulating Department, Ministry of Nature and Environment

i) Narangiin Enger

Our group has discussed the 6 candidate sites using the 0-5 assessment scheme. As Narangiin Enger is nearest to Ulaan Chuluut Disposal Site it has many advantages. Considering the infrastructure, the paved road and power supply to be provided by the pilot project for the improvement of Ulaan Chuluut Disposal Site, we have given it mark 0 for the criterion for General Site Conditions. Moreover, the economic benefit of Narangiin Enger candidate site is much better than other sites as it is located close to Ulaan Chuluut Disposal Site. As the pilot project for the Improvement of Ulaan Chuluut Disposal Site is being implemented the smoke caused by fire will be eliminated, also the soil contamination will be decreased, dust generated near the disposal site will be decreased. Furthermore a cut-off drain will be constructed in order to divert the rain water and flood which would otherwise damage the embankment. Consequently we have given mark 0 to Social conditions and Pollution respectively.

ii) XMK Disposal Site

For the General Site Conditions criterion we are giving a mark of 0 to this candidate site. However when we consider the social condition and pollution of this site, with residents living around it, there will definitely be a problem of environmental pollution and it will certainly effect the residents' social condition. Thus, we are giving marks of 3 for the social condition and 2 for pollution.

iii) Morin Davaa

This disposal site is located in the Biocombinate Restricted Area which produces veterinary medicine and injections and is also a livestock pasture area. Thus we consider that establishing a final disposal site here is not very convenient. Therefore, we are giving a mark of 1 for the General Site Conditions criterion. The Biocombinate Authority has on number of occasions official requested the removal of the Morin Davaa Disposal Site from their restricted area. The Airport is also located nearby, and waste disposed at the site will be scattered by the wind. It will also pollute the residential environment thereby affecting the social condition of residents therefore. We are therefore giving mark 2 for both the Social and pollution criteria. P

iv) Tsagaan Davaa

There is no infrastructure available at this site and we are therefore giving a mark of 2 for the General Site Conditions criterion. Also the wind direction frequently changes at this disposal site. It is also located in a low valley area and has a high probability that the wastes disposed there will be washed out by flood and rain water scattering it widely. Therefore, we are giving mark 2 for Social condition and 1 for Pollution.

v) Bayangiin Khonkhor

The Air Force has facilities close to this site. This area is wide-open pastureland. Thus, we have given a mark of 4 for the General Site Conditions criterion. This candidate site is located far from infrastructure therefore we are giving mark 3 for the Social condition and Pollution criteria respectively.

vi) Baganuur

For the General Site Conditions criterion we are giving mark 4. There are 52 boreholes extracting ground water therefore there is a high risk of contaminating the ground water as well as drinkable water thus, we have given mark 4 for Pollution. We are giving mark 1 for the Social conditions.

2. Group "B" Leader

Mr. Batsaikhan, Expert of City Development, Strategic Policy and Planning Department, Mayor's office of Ulaanbaatar City

We have discussed and given the following evaluation of the 6 of candidate sites. I would like to compare only the minimum and maximum scores of these candidate sites as we do not have enough time to give a long explanation.

In comparing the General Site Conditions we find that the condition of XMK is much better than the others therefore we gave it mark 0. It is the optimum location from every district as it is located in the center of Ulaanbaatar. We gave the least mark 5 to Baganuur due to the distance for transport being too far and additionally it has less economic benefit. If we can make some improvements to the existing “Dari Ekh” Disposal Site located south-east from Tsagaan Davaa, similar to the proposed improvements for Ulaan Chuluut Disposal, then definitely, the social conditions will be greatly improved and residents will be happy that their environment is getting better. Therefore, we are giving mark 0 to Tsagaan Davaa Disposal Site. For Baganuur we are giving the lowest mark 5 due to the high risk of contaminating the ground water which will have an adverse effect on the environment. For the category of Pollution we have given the lowest mark 5 to XMK and the highest mark 0 to Narangiin Enger. The location of XMK is in a settlement area which is surrounded by local residents thus, if the landfill area will be established at this candidate site the environmental pollution will be serious for the residents and also the residents will be unhappy with the noise of bulldozers. Therefore we have given the lowest mark 5 to XMK. But for Narangiin Enger candidate site, we are giving the highest mark 0 because it is very close to Ulaan Chuluut Disposal Site and additionally, the pilot project for Improvement of Ulaan Chuluut Disposal Site is going to be implemented in this area thus the smoke emission will be eliminated and environmental pollution will be greatly decreased.

According to our conclusion, the 6 candidate sites are ranked from best to worst in the following order:

- i) Narangiin Enger
- ii) Tsagaan Davaa
- iii) Morin Davaa
- iv) XMK Disposal Site
- v) Bayangiin Khonkhor
- vi) Baganuur

3. Group “C” Leader

Mr. Nuudel, Head of Modernization, Production and Service Department of Governor’s office, Songino Khaikhan District

We have selected 3 candidate sites as optimum candidate site to be discussed at the Steering Committee meeting. Frankly speaking, I do not know much about it technically therefore we discussed and these 3 sites are taking the following places.

- 1st place Narangiin Enger
- 2nd place Tsagaan Davaa
- 3rd place Baganuur

4. Group “D” Leader

Mr. Naran, Director of Nuuts Company

Waste from 6 districts has been disposed at Ulaan Chuluut Disposal Site since 1970 - for the last 30 years. There are many advantages and disadvantages of the Ulaan Chuluut Disposal Site.

Disadvantages:

- i) Ulaan Chuluut Disposal Site is located north-west of UB in a windy area thus there is a high probability of waste being scattered everywhere.

ii) The boundary of the Ger area in Songino Khairekhan District will be expanding further which will cause the Ger area to be closer to the Disposal Site.

Advantages: As the pilot project for Improvement of Ulaan Chuluut Disposal site will be implemented the environmental pollution, dust and smoke caused by fire will be dramatically decreased; thus as a result of this pilot project there will be a number of advantages to Narangiin Enger Disposal Site. Narangiin Enger is considered best on the 5 criteria if the power supply will be taken from nearby and a paved access road constructed from Ulaan Chuluut to Narangiin Enger Disposal Site it will make the conditions much better than at other sites. Also it has good economic benefit if we can establish a landfill area here. However the Tsagaan Davaa candidate site is located down wind. This candidate site is closer to the eastern districts and the transport expenditure is cheap therefore we are giving mark 0 for the General Site Conditions criteria. However, for the category of Pollution we are giving mark 2; and for Social conditions mark 0.

For the General Site Conditions criterion at Morin Davaa we are giving mark 5 because the Mongolian Airport is located very close by and there will be a high risk that waste will be spread over a wide area by the wind, thus possibly contaminating the environment near the Airport. Also the transport distance is far from the districts reinforcing the lowest mark of 5. For the category of Pollution criterion we are giving mark 3 to this site.

Baganuur may be totally unavailable because to establish a Final Disposal Site in a mining lease area is prohibited by Mongolian Law. Moreover the distance for transport is very far from districts and additionally there will be lots of stages to dispose of the waste at that site. As the Baganuur Coal Mine is located at this site there is a high risk of contamination of the ground water. Therefore considering all of these criteria we are giving mark 5 to Baganuur.

For Bayangiin Khonkhor candidate site we don't need even to think about it. Morin Davaa Disposal Site is the same. But for Tsagaan Davaa the situation it is a bit more complicated.

In accordance with our consideration, although the life of XMK is short the expenditure is low. The only problem with XMKDS is the lifetime as otherwise it can be one of the optimum sites. We may use this candidate site together with another site.

We consider that the best candidates are Narangiin Enger and Tsagaan Davaa. Therefore, we would like to suggest these two candidate sites to select as optimum candidate sites to be discussed at Steering Committee meeting.

A.6.3 Participants' Comments Submitted on the Workshop Evaluation Sheets.

S. Myagmarjav: The organization for the next workshop should be like this one. The next workshop should consider hazardous waste management.

Ts. Yura: I agree with all the issues discussed here.

Ch. Oyunbaatar: People should not repeat the issues that have been discussed earlier. I have a suggestion to implement a "Green Wall" project in accordance with the Government's future plans on the chosen disposal site.

P. Ganbaatar: It was organized well with an appropriate level of proficiency.

N. Oyuntsetseg: Lots of time was wasted during the Q & A session because some people did not have enough knowledge about solid waste management.

Ts. Bold: I like the current style and method for the workshops.

Sh. Dagva: It was organized with the appropriate level of proficiency.

B. Oyun: It's better to organize the next workshop after the Pilot Project has been implemented.

D. Sukhbat: This workshop was well organized.

B. Naran: Today's workshop was well organized and subsequent workshops should follow its style.

M. Zoljargal: Include related people from Tuul-21 and WWF NGOs, for example Tuul-21 has experience in conducting evaluation of industrial waste.

L. Baatartsogt: The discussion drifted away from the main topic. The workshop wasted lots of time by discussing disposal site operations instead of talking only about choosing one disposal site out of six candidate sites.

Ts. Nuudel: The Workshop has come to a good conclusion.

Balgansuren: It gave me the impression that you were trying to guide us towards a specific decision with your unrealistic information. It is unfortunate that industrial waste was excluded from the hazardous wastes. Calculating the UB city waste amount without calculating the construction waste is too unrealistic for the current situation of the city. To use XMK until 2008 is, in my opinion, very profitable because: 1. It requires lower costs 2. Good for rehabilitating the land after using it as a disposal site.

Tsengel: 1. Organize a trip to the candidate sites 2. Always organize specific works to advertise about the study to the public 3. Send technical working group members for training and lectures to Japan and China.

Sodnompil: It is good to invite Residents' representatives to this workshop to advertise this good work that is being implemented by the Japanese side and to introduce and teach about SWM to residents. More advertising should be done and lots of information should be given to the public.

D. Ganbold: 1. Organize a meeting with SKHD 4 Khoroo people before starting the Pilot Project 2. Next workshop should be done after 3-6 months after the Pilot Project has been implemented 3. Include in the project the cleaning schedule of the Districts and khoroos that are passed through by collection vehicles 4. JICA, Governor's Office, and Mayor's Office should cooperate closely.

D. Batdorj: Use 2 sites simultaneously by carefully calculating the costs.

Z. Erdenekhuu: I think it's good to have a workshop about the effects and impacts on society.

Sh. Vanganjil: I was not included in the 1st workshop. Thank you for inviting me this time. I think we are the main people who fight with waste, thus please include us in the next workshop.

N. Shijirbaatar: The next workshop should be organized like this one.

Appendix 7: Participant Evaluation

PARTICIPANT EVALUATION SHEET

Name.....

Position.....

Contact Tel. No.

Please circle 1-5 to score the criteria in the following way:

1 = poor

2 = not very good

3 = average

4 = very good

5 = excellent

A. Was the workshop useful to you?

1 2 3 4 5

B. Do you think that the workshop advanced the common understanding of problems and the recognition of the need for joint co-operation?.....

1 2 3 4 5

C. Do you think that the workshop made a positive contribution to the study?

1 2 3 4 5

D. Was the conduct of the Workshop efficient and enjoyable?

1 2 3 4 5

E. How do you rate the overall success of the Workshop?

1 2 3 4 5

Please make any comments you wish for the further consideration of the Study Team and / or the conduct of future Workshops.

.....
.....
.....
.....
.....
.....
.....

CONSOLIDATED PARTICIPANT EVALUATION

A. Was the Workshop useful to you?

	1	2	3	4	5	Total
scores	0	0	1	10	26	37
% scores	0%	0%	3%	27%	70%	100%
Mean scores -	94%					
	4.7					

B. Do you think that the Workshop advanced the common understanding of problems and the recognition of the need for joint co-operation?

	1	2	3	4	5	Total
scores	0	0	0	13	24	37
% scores	0%	0%	0%	0%	35%	100%
Mean scores -	93%					
	4.6					

C. Do you think that the workshop made a positive contribution to the study?

	1	2	3	4	5	Total
scores	0	1	1	7	28	37
% scores	0%	3%	3%	19%	76%	100%
Mean scores -	94%					
	4.7					

D. Was the conduct of the Workshop efficient and enjoyable?

	1	2	3	4	5	Total
Scores	0	0	1	9	27	37
% scores	0%	0%	3%	24%	73%	100%
Mean scores -	94%					
	4.7					

E. How do you rate the overall success of the Workshop?

	1	2	3	4	5	Total
scores	0	0	1	107	26	37
% scores	0%	0%	3%	27%	70%	100%
Mean scores -	94%					
	4.7					

SUMMARY

Most scores were the highest - excellent: 70%, 65%, 76%, 73%, 70%.

Mean scores out of maximum of 5 were 4.7 for four questions and 4.6 for one.

Mean scores as a % of maximum possible were 94% for four questions and 93%, for one.

4.2.3 Third Workshop

THE STUDY ON SOLID WASTE MANAGEMENT PLAN FOR ULAANBAATAR CITY IN MONGOLIA

REPORT OF THIRD WORKSHOP

October 2005

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1 Introduction

Since the start of the JICA study, two workshops were organized in December, 2004, and April, 2005.

The First Workshop had the following objectives:

- to share experience and problems;
- to increase awareness of and links to problems elsewhere in the sector; and
- to begin to build consensus through co-operation in improving Solid Waste Management in Ulaanbaatar.

The objectives of the Second Workshop were:

- to understand the needs of siting future disposal sites for the formulation of the SWM Master Plan (M/P);
- to examine and discuss the advantages and disadvantages of the SWM technical system alternatives for six candidates for future final disposal site(s); and
- to make recommendations regarding future final disposal site(s) for SWM in Ulaanbaatar City.

The third workshop was organized on the 18th of October in order to evaluate the progress of pilot projects. Since some of pilot projects just started, two projects conducted in Khoroo 4 of the Songinokhairkhan district, “Urgent Improvement of the Ulaan Chuluut Disposal Site” and “Raising Public Consciousness of Waste Issues”, were selected as the targeted pilot projects.

Main participants of previous two workshops were members of the Technical Working Group and counter parts. This time, local residents in Khoroo 4 and waste pickers, who worked at the Ulaan Chuluut disposal site, were invited as the main evaluators.

2 Object

The main object of the 3rd workshop was to evaluate the progress of the following two pilot projects in Khoroo 4 of the Songinokhairkhan District by local residents and waste pickers.

- Urgent Improvement of the Ulaan Chuluut Disposal Site
- Raising Public Consciousness on Waste Issues,

If necessary, the plan of pilot projects will be modified base on the result of the workshop.

3 Approach and Evaluation Method

3.1 Targeted participants

The main targets of the 3rd workshop are local stakeholders such as local residents and waste pickers working at the Ulaan Chuluut disposal site.

As a matter of fact, many of waste pickers at the disposal site are also residents of Khoroo 4. However, the interests of waste pickers and the rest of residents about the pilot project at the disposal site were expected to be different. In addition, it was likely that some waste pickers felt intimidated by local residents. Therefore, the targeted people are divided into two groups,

(1) local residents of Khoroo 4 who do not work at the disposal site and (2) those who are working at the disposal site, and two meetings were arranged separately as shown below.

- Part 1: Workshop for local residents
- Part 2: Workshop for those who are working at the disposal site

At the workshop for local residents, both of the two projects were evaluated, while only Urgent Improvement of the Ulaan Chuluut disposal site was evaluated at the latter workshop.

The team called for the participation of local residents in the Workshop through a leaflet, while asking Khoroo 4 to invite 20 people who participated in the first participatory evaluation of the pilot project at the disposal site, since they knew the conditions of the disposal site before the pilot project started. All the people who wanted to join the workshop were accepted.

As for the workshop for waste pickers, the a site manager of the disposal site distributed invitation letters to waste pickers at the disposal site, asking them that one person from each family participate in the workshop.

3.2 Procedure of Workshop

At each workshop, before the evaluation session, the outline of the targeted pilot projects was explained through lecture style session. At the workshop for local residents, a site tour to the disposal site and illegal dumping places was arranged after the explanation of the pilot projects, so that participants could understand the explanation more.

3.3 Evaluation Method

Regarding the evaluation method, all the participants were required to write answers to several questions by the team. Since the number of participants was relatively large and ordinary Mongolian people, in particular waste pickers, tend to hesitate to speak their opinions in front of others, the evaluation method through the group discussion was not used.

4 Outline of Workshop

As mentioned above, the third workshop was divided into 2 parts: (1) Local resident meeting and (2) Waste picker meeting. The outline of the workshop was summarized below.

4.1 Workshop for Local Residents

(1) Targeted pilot projects

As already mentioned, all the two pilot projects in Khoroo 4 were selected as targeted projects for evaluation.

- Urgent Improvement of the Ulaan Chuluut Disposal Site
- Raising public awareness on waste issues

(2) Targeted participants

- Local residents who do not work at the disposal site: 50 people including those who participated in the first evaluation were invited

(3) Procedure

The whole program was divided into three parts: (1) Explanation of pilot project (lecture style session), (2) Site tour to the disposal site, and (3) Evaluation session (evaluation session of pilot project).

Since most of participants had not visited the disposal site in the last few months, the site tour was arranged. During the site tour, all the participants were requested to fill in the same check-sheet for the regular monitoring (see Appendix 2). The result of the check-sheet was evaluated as the second participatory evaluation of the pilot project “Urgent improvement of the Ulaan Chuluut disposal site.

During the evaluation session, all the participants were required to write answers to the following questions.

1) Evaluation of “Urgent Improvement of the Ulaan Chuluut Disposal Site”

- Changes in environmental conditions (Are there any changes by the pilot project? If so, what is improved and what is not improve or worsen?)
- Other comments on the project

2) Evaluation of “Raising public awareness on waste issues”

- Changes in people’s awareness (Are there any changes in your awareness by the pilot project? If so, what is improved and what kinds of changes occurred?)
- Effect of educational materials (Opinions and comments on educational materials such as leaflet and banners)
- Changes in people’s behaviour (Are there any changed in your behaviors?)

The procedure of the workshop is shown in Table 1.

Table 1: Procedure of Workshop for Local Residents

Part I: Explanation of Pilot Projects
Opening Remark
Outline of the workshop
Pilot Project: Urgent improvement of Ulaan Chuluut Disposal Site
Pilot Project: Raising public awareness on waste issues
Explanation of site tour and how to fill in the check-sheet
Part II: Site tour
Tour to the disposal site and some illegal dumping places in Khoroo 4
Part III: Evaluation
Explanation how to proceed evaluation
Evaluation
Summary of evaluation
Closing Remark

4.2 Workshop for Those Who Work at the Disposal Site

(1) Targeted pilot project

- Urgent Improvement of the Ulaan Chuluut Disposal Site

(2) Targeted participants

- All the waste pickers who want to join the workshop: one person from each household was invited

(3) Procedure

The workshop was divided into two parts: (1) Explanation of pilot project and (2) Evaluation session.

During the evaluation session, all the participants were requested to write answers to the following questions.

- Changes in environmental conditions (Are there any changes by the pilot project? If so, what is improved and what is not improve or worsen?)
- Changes in working conditions (Are there any changes by the pilot project? If so, what is improved and what is not improve or worsen?)
- Other comments on the project

Since some of them had difficulty of writing and could not specify their opinions, the following measure was taken in order to grasp their opinions.

- 1) Two different colors of small paper sheets were prepared.
- 2) When they were asked if the environmental/working conditions were changed, if they thought the conditions were improved they selected yellow paper sheets and wrote what was improved. If they thought the conditions were worsened, they selected green paper sheets and wrote what was worsened.
- 3) Even though they could not specify what was improved or worsened, they were requested to attach the paper sheet on the designated places. This could make it possible for us how many participants evaluate the result of the pilot project positively or negatively.

In addition, it was expected that some of waste pickers felt intimidated, an ice-breaking game was conducted in order to make them relaxed, before the evaluation session started.

The procedure of the workshop for waste pickers was shown below.

Table 2: Procedure of Workshop for Those Who Work at the Disposal Site

Part I: Explanation of Pilot Projects	
	Opening Remark
	Outline of the workshop
	Pilot Project: Urgent improvement of Ulaan Chuluut Disposal Site
◆	Facility Improvement
◆	Operation Improvement (Details plan including future sanitary landfill operation plan)
Part II: Evaluation	
	Explanation how to proceed discussion
	Ice-breaking game
	Evaluation
	Summary of Evaluation

5 Result

5.1 Workshop for Local Residents

The workshop for local residents was organized in the morning of October 18 at the meeting place of Khoroo 4.

5.1.1 Participants

The number of local residents who participated in the evaluation session was 55. The distribution by age and sex was shown in the table below. A staffer of Health Center, who is a member of the Monitoring Committee, also join the session. Therefore, the total number of participants was 56. Not all the participants answered to questions.

Table 3: Distribution of Participants by Age and Sex

Age group	female	male	total
20s	8		8
30s	7	3	10
40s	8	2	10
50s	5	3	8
60s	11		11
70s	6	1	7
80s	1		1
total	46	9	55

5.1.2 Result of Evaluation

The result of answers to the following questions is summarized.

Q1: Are there any changes in environmental conditions? If so, what is improved and what is worsened?

Q2: Are the any changes in your awareness about waste? If so, what kinds of changes occurred?

Q3: Are there any changes in your behavior to discharge waste?

Q4: How do you think about educational materials such as leaflet and banners?

Q5: Other comments

(1) Q1: Are there any changes in environmental conditions?

The number of participants who responded to the question was 44. Among them, 40 participants wrote evaluated the progress of the projects positively, while 4 evaluated it negatively.

Here are the changes participants thought.

Positive response

	count
A lot of things are improved by pilot project and environmental condition became better.	19
A lot of facilities are constructed and installed at the disposal site. It is very good	11
Illegal dumping and scattered waste are decreased.	9
To conducted sanitary landfill operation. It is very good.	6
Fire and offensive odor is decreased	4
Others	2

*Some participants wrote plural things.

Negative response

	count
A lot of children work at the disposal site	1
Scattered plastic bags do not decrease. Fires also do not decrease.	1
The health become very bad by dust from access road	1
The pilot project at the disposal site worsened working conditions of waste pickers.	1

(2) Q2 Are the any changes in your awareness about waste?

37 people responded to the question. The summarized answers are shown below.

	count
Positive response	
people's awareness improved because made a lot of things by pilot project	21
Neutral response	
people's awareness is improved than before, but not all people	9
Negative response	
There are not changes in people's awareness. It is same as before	7

(3) Q3 Are there any changes in your behavior to discharge waste?

27 people responded to the question.

	count
Positive response	
A lot of things are changed and improved	4
Illegal dumping decreased.	5
Negative response	
Not changed and not improved	16
people discharge waste illegally like before	7

(4) Q4 How do you think about educational materials such as leaflet and banners?

43 participants wrote comments and opinions about educational materials.

	count
It was very good and it is easy to understand	25
It was good. But it wasn't enough to distribution everybody	14
it is necessary to distribute educational materials more than before.	20
It is necessary to send it on the air on the radio and TV and in the newspaper	3
It needs to conduct various kinds of training about waste issue	7

(5) Q5 Other comments

48 participants made general comments on two pilot projects. Their comments are summarized below.

	count
To schedule collection service and to collect waste by special purpose collection vehicles	13
To put special purpose trash bins between streets or point discharge point	5
To make pavement and improve a access road	16
To impose a fine on someone who are discharged illegally	3
To take measures to decrease plastic bags	13
Others	12

Others:

To increase the number of collection vehicles
To build more moveable fences prevent to scatter waste in the disposal site
To need tighten security and control at the disposal site
To supply special purpose collection vehicles
To build green-belt and plant tree,lay down a lawn
To organize clean-up activity many times
To arrange a collection fee system and to establish monitoring system
1.To introduce new system that Households sort out their wastes.
2.To have to be cleaned waste around disposal site by local people and you pay money for their collected waste.
To improve work condition of waste pickers and to supply working clothes them.
1. To cover waste which is discharged in the ravine by soil.
2. To introduce new idea reduce a consumption of plastic bags
To tighten security and control at the disposal site
To introduce new system that Households sort out their wastes.

5.2 Workshop for Those Who Work at the Disposal Site

The workshop for those who work at the disposal site was organized in the afternoon of October 18, after the workshop for local residents, at the worm garage of the Ulaan Chuluut disposal site.

5.2.1 Participants

In total, 81 person including children participated in the workshop. The distribution by age and sex is shown below.

Table 4: Distribution of Participants by Age and Sex

Age group	female	male	Total
10-19	4	3	7
20-29	3	5	8
30-39	16	8	24
40-49	18	11	29
50-59	3	8	11
60-69		2	2
Total	44	37	81

5.2.2 Result of evaluation

At the workshop, the following three questions were asked.

Q1: Are there any changes in environmental conditions? If so, what is improved and what is worsened?

Q2: Are there any changes in working conditions? Is so, what is improved and what is worsened?

Q3: Other comments

The responses from participants are summarized mellow.

(1) Q1: Are there any changes in environmental conditions?

All the participants responded to this question. Those who thought the pilot project improved their environmental conditions selected yellow paper sheet, while those who thought the pilot project worsened the conditions selected green paper sheets.

The number of those who selected yellow paper sheets was 74, and among them 52 people specified the items which were improved (some respondents wrote more than one issues). 7 participants selected green paper sheets and 6 out of 7 wrote worsened items.

Positive response

Total number of respondents who evaluate the project positively	74
A lot of things are improved, regarding the environmental conditions.	56
Environmental pollution is reduced and it is good for our health	6
Decreased offensive odor	8
Facilities are constructed and there are fewer scattering waste than before	4
There are fewer fires and less smoke.	9

Negative response

Total number of respondents who evaluate the progress negatively	7
Operation is bad, not enough	1
There is a pollution problem in the disposal site	4
There are a lot of children working at the disposal site	1
Buyer buy very cheap and mismeasure our picked raw materials	1

(2) Q2: Are there any changes in working conditions?

The number of participants who responded to the question was 37, less than half of the whole participants. 27 people responded that the working conditions were improved, while 10 people evaluated the progress of the project negatively.

Positive response

Total number of respondents who evaluated the progress positively	27
Working condition is good	13
Improved sanitary condition and it is good for health	6
Became orderly and keeping rule	6
Others	4
To give my thanks for listening to our opinions	
Registration made us confident to continue to work here	

Negative response

Total number of respondents who evaluated the progress negatively	10
The Working conditions are not improved	3
TV reporters met us and spread misinformation	4
Buyers buy raw materials very cheap from us	4
Our income decreased, because a lot of new comers came due to waste picker registration	1

(3) Q3: Other comments

53 participants made general comments on the pilot project. Their comments are summarized below.

	total
Want working clothes to be supplied	7
Want public bath, lavatory and canteen to be constructed	11
Need to stop children jumping on trucks	9
If there is place or person who is buying our raw materials, it is good	8
Need to stop press media broadcast misinformation about us	3
To continue waste pickers registration add new comers	3
A larger working area is necessary. Now there are too many waste pickers in too small site	8
Want service of minibus and hospital	4
Others	11

Others

It is better to start levelling and covering waste early time. This makes it possible not to intervene the unloading work during the rush hours.
Need to improve more than this
Need to sort waste
Need to do more than this
It is necessary to supply safety operation
It is necessary to establish more strict rules and order
Need to supply technical completeness
To make more clean environment
To be make travelling-trade in the disposal site
To supply health service

6 Findings

6.1 Workshop for Local Residents

(1) Urgent Improvement of the Ulaan Chuluut Disposal Site

In general, participants appreciate the pilot project, but some of them misunderstood the progress of the project. Even though the trial of the operational improvement had just started and the operational conditions were not improved at the time of the workshop, some participants thought that the sanitary landfill operation was already applied.

Since the expectation of local residents about the pilot project at the disposal site seemed quite high, it is important for MUB and the team to make sure of the realization of the proper operation by the next spring, when strong wind would worsen such problems as scattered waste and fires.

(2) Raising Public Consciousness on Waste Issues

This pilot project made an impact on some of local residents in Khoroo 4. The team hopes that these people would take a leading role in the solid waste management related activities in the future.

On the other hand, it is necessary to take the next step, which is associated with specific activities such as discharge rules, in order to promote the participation of other people. However, it is almost impossible to introduce discharge rules without the improvement of collection system, in particular the fixed schedule of collection services. According to the proposed Master Plan, a priority will be given to the improvement of the collection system in the Apartment area. This could strengthen the finance of TUKs and make it possible for them to provide better services in the Ger area. Therefore, it can be said that it takes a few years before the discharge rules are introduced in the Ger area.

Educational materials basically received good reactions from participants. It is probably because the information on solid waste management issues was limited before the JICA project started. It is necessary for MUB to continue cost effective public relations activity in the whole area of Ulaanbaatar.

6.2 Workshop for Those Who Work at the Disposal Site

All the participants responded to the first question about the changes in environmental conditions. This reflected from the high level of interest. The majority of participants appreciate the improvement of the environmental conditions by the pilot project.

On the other hand, the number of participants who responded to the second question about the changes in working conditions was only 37, less than half of the total participants. Even though the number of people who showed their content was larger than those who responded negatively, it could be speculated that many of those who did not respond were dissatisfied with the progress of the project.

Under the controlled landfill operation, collection vehicles can unload waste only at the designated place. This makes the waste picking area much smaller than before, and makes waste picking work more difficult. Therefore, it is understandable that many of waste pickers are dissatisfied with the progress of the project.

Since the controlled landfill operation is the core of the concept of the project and it is impossible to make concession to them. In stead, it is necessary to make some measures of fair trade and better sanitary conditions in order to gain more support from them.

Appendix 1: Participant List

(1) Workshop for Local Residents

Participant list except local residents

Name	name of organization	position
Ch. Batsaihan	Mayor's Office MUB	Specialist of City Development, Strategic Policy and Planning Department
B. Delgerbayar	Governor's Office MUB	Officer of Public Service Department
Gonchigsumla a	MOE	
Enhjargal	khoroos 4	Health center staffer
Togoldor	JICA	
Jambaldorj	Nuuts.co	director
Enhee	NGO-World Vision	
Baatarjav	NGO-Baigal Erdene Fund	
Chuluundolgor	NGO "tolgoit"	
Kani	JICA Study Team	
Tuul (Facilitator)		

(2) Workshop for those who work at the disposal site

Participant list except waste pickers

name	name of organization	Position
Jambaldorj	Nuuts.co	director
Shimura	JICA study team	Leader
Kani	JICA study team	
Hara	JICA Senior Expert	
Tuul (Facilitator)		

Appendix 2: Program

Date: October 18, 2005

(1) Workshop for Local Residents

Venue: a meeting place of Khoroo 4 of Songinokhairkhan

	Time	Topic	
1	9:45 – 10:00	Registration	
Part I: Explanation of Pilot Projects			
	10:00 – 10:05	Opening Remark	Mr. Ganbold Khoroo 4 Governor
	10:05 – 10:10	Outline of the workshop	Ms. Tuul (Facilitator)
	10:10 – 10:20	Pilot Project: Urgent improvement of Ulaan Chuluut Disposal Site	Mr. Jambaldorj Nuut. Co
	10:20 – 10:30	Pilot Project: Raising public awareness on waste issues	Mr. Delgerbayar MUB
	10:30 – 10:35	Explanation of site tour and how to fill in the check-sheet	Mr. Delgerbayar MUB
Part II: Site tour			
	10:35 – 11:30	Tour to the disposal site and some illegal dumping places in Khoroo 4	Mr. Jambaldorj Nuut. Co
Part III: Evaluation			
7	11:30 – 11:35	Explanation how to proceed evaluation	Ms. Tuul
8	11:35 – 12: 30	Evaluation	Ms. Tuul
9	12:30 – 12:40	Summary of evaluation	Ms. Tuul
10	12:40 – 12:45	Closing Remark	

(2) Workshop for those who work at the disposal site

Venue: a warm garage at the disposal site

	Time	Topic	
1	3:15 – 3:30	Registration	
Part I: Explanation of Pilot Projects			
2	3:30 – 3:35	Opening Remark	Mr. Jambaldorj Nuut. Co
3	3:35 -3:40	Outline of the workshop	Ms. Tuul
4	3:40 – 4:00	Pilot Project: Urgent improvement of Ulaan Chuluut Disposal Site ◆ Facility Improvement ◆ Operation Improvement (Details plan including future sanitary landfill operation plan)	Mr. Jambaldorj Nuut. Co
Part II: Evaluation			
5	4:00 – 4:05	Explanation how to proceed discussion	Ms. Tuul (Facilitator)
6	4:05 – 4:20	Ice-breaking game	Ms. Tuul
7	4:20 – 5:10	Evaluation	Ms. Tuul
8	5:10 – 5:15	Summary of Evaluation	Ms. Tuul

Appendix 3: Check-sheet for monitoring the disposal site

Check List for the regular monitoring		Date				
		Name				
		Name of organization				
Category A: Environment effect and operational conditions (Before and after the construction)						
Environment Effect						
	Items	Acceptable	Medium	Terrible	Score	Note
	Fire & Smoke	3	2	1		
	Offensive odor	3	2	1		
	Wastewater	3	2	1		
	Waste scattering	3	2	1		
	Animals (dog s, birds, etc)	3	2	1		
	Vermin (flies, worms, etc)	3	2	1		
	View	3	2	1		
Operational Conditions (how much the operator control the whole land fill operation)						
	Items	Well controlled or operated	Medium	Terrible	Score	Note
	Whole operation	3	2	1		
	Working situations of waste pickers	3	2	1		
	collection vehicles	3	2	1		
	Bulldozer and other landfill operation heavy vehicles	3	2	1		
	Location of unloading waste	3	2	1		
	Sprinkling of insecticide or vermicide	3	2	1		
Total of Category A						
Category B: Function of facilities (After finishing construction)						
	Items	Functioning	Medium	Not-functioning	Score	Note
	Access road	3	2	1		
	Weighbridge (measurement facilities and computer system)	3	2	1		
	On-site road	3	2	1		
	Working face (Movable type offence for preventing waste scattering, etc)	3	2	1		
	Gas removal facilities	3	2	1		
	Security facilities Fence (fixed type), Gate, Bank	3	2	1		
	Leachate treatment facilities	3	2	1		
	Drainage systems	3	2	1		
Total of Category B						
Comment						

4.2.4 Fourth Workshop

THE STUDY ON SOLID WASTE MANAGEMENT PLAN FOR ULAANBAATAR CITY IN MONGOLIA

REPORT OF FOURTH WORKSHOP

May 2006

Contents

1	Outline of the Workshop	4-121
1.1	Date and Venue.....	4-121
1.2	Participants	4-121
1.3	Program	4-121
2	Question and Answers.....	4-121

1 Outline of the Workshop

The 4th workshop was held in order to publicize the results of the 1st mixed combustion test. The outline of the workshop is presented below.

1.1 Date and Venue

Date: May 17th (Wed), 2006
Place: 8th Floor, Conference room at MUB Building
Time: 10:00 to 13:00

1.2 Participants

The participants will be invited from the following organizations:

- Ministry of Energy
- Ministry of Environment
- Specialized Inspection Agency
- Municipality of Ulaanbaatar
- Members of the Technical Working Group
- Nalaikh Heating Plant
- Representatives of NGOs
- Mass Media

1.3 Program

Topic	Expositor	Time
1. Registration		10:00 – 10:30
2. Opening Address by MUB	MUB	10:30 – 10:40
3. Video Show of RDF Production and Mix Combustion Test	JICA Study Team	10:40 – 10:50 (10 minutes)
4. Results of the 1st Mixed Combustion Test of RDF with Coal	Mr. Delgerbayar, MUB Ms. Sarantuya, MOE	10:50 – 11:50 (One hour)
5. Tea Break		11:50 – 12:00
6. Question and Answer	MUB, JICA study team	12:00 – 12:40 (40minutes)
7. Closing Speech by MUB including upcoming schedule	MUB	12:40 – 12:50

2 Question and Answers

The question and answers of the workshop is presented below.

Q1: What is the reason not to conduct test at Power Plant No 4?

A1: **Delgerbayar** (MUB):

It depends on furnace type. The RDF can be used at Baganuur, Nalaikh and 3rd Power Plant. However, due to different standard of Power Plant No 4 it can not be used there.

Q2: Bum-Yalagch (Mongolian Green party):

I would like to raise the question that I asked on the project's first public hearing meeting. Although the answer was given at that, I consider that I have not received full answer to that question.

We are working together with one of the Japanese Institution. I have learned that a RDF technology was initially originated in Germany and later it was widely utilized in Japan. What is the degree of the safety to commercially utilize this product? I have heard that there were 6 accidents in Japanese RDF factories. The cause was the self burn up of RDF in storage facilities which later caused blasts in factories. I heard that due to the accidents those factories were closed. However, your experts consider this product completely safe. Are there any chances of such accidents during storage time in Mongolia?

A2: Shimura (Study Team Leader):

It is a very good question. Yes, there was an accident that you have explained in Japan. The main cause of the accident was that RDF manufacturing companies were promoting to include kitchen waste in RDF composition. When kitchen waste decomposes in anaerobic condition, it generates methane gas under Japanese humid weather. The gas exploded and burned. Our plan excludes such situation. Our RDF will be made of plastic and paper only. No kitchen waste will be in the content of RDF. Based on Japanese experiences we will be able to avoid such kind of accidents.

Q3: Purevtsend (Evt Chuluut LLC):

Is JICA providing assistance only in this field since such projects has to address social issues and poverty alleviation? Will be there any investment in private recycling business?

A3: Delgerbayar:

Our project is being implemented since December 2004. Within our project activity, we will draft environment friendly SWM Plan with future assistance of the Japanese Government Grant Aid. You just have raised the issue how the project is going to address social and poverty issues as well as recycling activities. Since UCDS' lifetime is going to expire in few years we are planning to establish new disposal site at NEDS. The Narangiin Enger Recycling Complex with all infrastructure facilities will be constructed next to NEDS. At the NERC, the RDF plant together with the land for private recycling sector will be established. We will promote private recyclers to have their business next to NEDS, raw material source. Also, we are planning to establish sorting yard which will provide opportunities for employment.

Q4: Bum-Yalagch:

What is the cost of producing one bag of RDF??

A4: Delgerbayar:

1 ton of RDF is 9 USD¹ with our plan while 1 ton of coal is 13 USD.

Q4: Bum-Yalagch:

¹ 9USD is sales income and production cost is 27USD. See the screen 17 of the presentation.

So, if its cost is lower than coal and calorific value is higher than coal people will start burning RDF at household stoves, won't they?

A4: Delgerbayar:

After the production, the final product will be directly supplied to the power plants.

Q4: Bum-Yalagch:

Please think, as you have just seen on presentations, RDF is very simple to produce. People can easily to produce RDF at household level illegally. What will you do in that circumstance?

A4: Delgerbayar:

Those actions will be prohibited. We will take necessary measures to prohibit such kind of productions.

Q5: Dagva (Ministry of Energy):

I have a question to Ms Sarantuya. You have said that your emission gas standards impossible to compare with other international standards. Due to that problem you have said that you have compared with Japanese standards only. If I am not mistaken, Mongolia is a member of Stockholm Convention which has relevant materials on international standards. Why didn't you compare with those standards or recommendations?

A4: Sarantuya (Ministry of Environment):

No, we did not compare with other country or international standards. The ST is used only their own Japanese standards. => The Study Team prepares an article ~~with~~ explains the Stockholm Convention and a comparison table ~~with~~ J standard.

Q5: Dagva:

The ST is used Japanese standards only. What about the Ministry of Environment? Couldn't you compare results with existing international standards?

A4: Sarantuya:

We did not have time to compare. I just received test results last Friday. That why we did not have time to conduct comparing analysis.

Q5: Jargalsaikhan:

(Director, Engineering Facilities Department, MUB): I have a few comments.

We are closely monitoring the project progress, and we are involved from the beginning of this project since we have recommended using the NHP for test.

Comment 1: We have to understand well the main purpose of RDF introduction in Mongolia. The main objective is to increase our coal's calorific value with the RDF introduction. Recently we have started the operation of the Bagahangai heating plant with 1.8Mevatt capacity designed to burn 4000 kcal coal. However, the plant cannot reach its capacity due to the fuel quality. The RDF is a by-product that will increase calorific value of the coal. Concerning the non possibility of use of Power Plant No 4, the presenter have mentioned that

due to the technology difference used at Power Plant No4 the test can not be conducted there and it is possible if you change technology. Here I want you to follow our main objectives. As you know all our power plants are designed to run on coal, so, there is should not be any discussions about change of technology of certain power plant.

Comment 2: Concerning the emission gas analysis, the comparison is wrong. You have to compare only with coal. For example, HCI has increased from 0.08 to 0.11 ppm. Ms Sarantuya says that there is slightly over than RDF2% mixture. You can not say that. If you compare by percentage there is more than 30% increase. I consider that even a slight increase in dioxins, it is a serious matter. The test analyses have to be based on percentage basis for comparison.

Comment 3: From now on, we have to carefully plan who, which organization will be involved in the next combustion test? For example, heating engineers must be included. We have to think together on ways to increase coal calorific value from current 3200 kcal to 4000-4200 kcal.

Comment 4: It is very good results on economic efficiency reducing coal consumption from 15 tons to 8 tons. However, please examine carefully how much the increased amount of toxic elements in air will cause harmful effects to human health and environment.

Q6: Narantuya (Director, Public Health Institution):

1: Have you enrolled any health officials in your test since it is related to the air pollution issues? From your test presentation it is understood that analysis results are slightly over Japanese standards and higher than Mongolian standards. Is that so? There is a decrease of toxic elements in case of 4% combustion test. Does it mean that 4% mixture case is safe and do not generate dioxin? Concerning the economic effects, in light SME promotion, have you proposed your idea to private business to promote their manufacturing activities?

A6: Delgerbayar:

I would like to start with 3rd question. We can not propose RDF project to private entity since there will be many negative consequences. If we allow, RDF will start to be burnt at household level. Thus, we will produce RDF under the MUB control. This time we have used manual methods of production. As you have seen during presentation the special RDF machine will be used for the future RDF production next to new NEDS with assistance of grant aid that will significantly reduce plastic bags and contribute to the environment preservation.

Concerning the 1st question, we have conducted the test involving all relevant experts. Certainly at this stage we still faces some shortcomings. Today we organize this meeting in order to identify whom we involve in the next step and what to take into considerations in the future. The issue that we are presenting you today is not approved or agreed. We are in the stage of studying and we need your active cooperation in the future.

Concerning the issue raised by Mr Jargalsaihan on chlorine, I would like to inform you it is in study progress. Based on emission gas analyses we will figure out what kind of filters we have to install, what kind of filters Japanese incinerators are using. So that will be the next step measures that we have to take into account.

A6: Sarantuyaa:

Concerning question on standards, we do not have dioxin standards at this moment in Mongolia, on others measured values we have.

A7: Bum-Yalagch:

There is waste composition survey done by Ministry of Health. They link in their survey kitchen waste with poverty level. So low level of kitchen waste is related with people's living standards, is that so?

A7: Bold (MUB):

The Ministry of Health has conducted that survey last year. Our ST also has conducted winter and summer WACS. The results of WACS have shown that the kitchen waste amount won't increase much in the future. I have heard rumors that in previous time, one could collect from 20 to 30 liters of kitchen waste from Ulaanbaatar and Bayangol Hotels to use as pet food, and this is no longer available.

Shimura:

When we analyzed the WACS results, MUB's waste composition is quite similar to the other developed countries' composition. There is a large amount of plastic and paper, and less kitchen waste. Waste composition depends on one country's economic capacity and diversion. Certainly in terms of amount it is much smaller than Japan. However, composition is similar to Japan, especially fewer kitchen waste and more paper/plastic wastes. Also Ulaanbaatar city is a capital city of country where all industrial and business activity is centralized. So, this tendency will progress in the future that will contribute to the generation of more plastic and paper type of waste. Another factor about kitchen waste, you do not have much vegetable and fruits production and consumption in Mongolia.

Q8: Batsaikhan (Ministry of Environment): First of all let me highlight that your project is very important one. I have a few questions.

1: Your results have shown that the RDF mixed combustion test is economically very efficient. Were there any other means to improve efficiency by power plants themselves? Were there any results of such kind of improvement measures? Is your proposal the first one to improve efficiency?

2: You have conducted test with 2% and 4% percent mixture respectively with gradual improvement. Have you conducted test with 5-6% mixture? Have you found the optimal mixture amount?

3: Concerning the RDF calorific value, it seems that the RDF calorific value depends on paper and plastic proportion. What is the raw material mixture proportion? Have you found the optimal proportion?

4: You have said that 1 ton of RDF is 9 USD. How did you calculate cost of 1 ton of RDF? What was the purchase price of plastic and paper?

5: How did you calculate the boiler efficiency?

A8: Delgerbayar: 1: Since I am responsible for waste management I am not able to answer you whether power plants have conducted any efficiency improvement measures by themselves. We have concentrated on how to decrease amount of waste with economic efficiency and combust at power plant to improve their efficiency operation.

2: The mixed proportion was set according to the power plant's capacity. We initially planned to mix with 8-10%. However, due to furnace internal combustion capacity it was decreased to 2-4%. It is possible to mix at 5-6% mixture, but we have to carefully consider not causing any damages to internal parts of Nalaikh Heating Plant's furnaces. The RDF

combusted as it is in Germany and Japan due to the specially designed furnaces that actually do not generate toxic emission gases.

3: Certainly the calorific value will change depending on raw material proportion. For example, if we decrease amount of plastic and increase amount of paper, the calorific value will decrease.


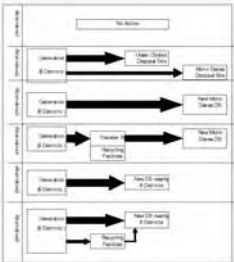
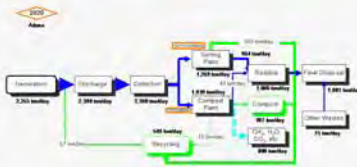
4: As of raw material purchase, we plan not to purchase the RDF raw material from residents. We will get plastic and paper for free from the disposal site. The high quality plastic, even today, you can not find at disposal site, it is in shortage. It costs more than 50 tugrugs. However, thin and low quality blue and white plastic bags used for vegetable and fruits packing with 10-20 tugrugs cost are everywhere. We have to utilize those types of plastic bags. Based on 6 TUKs and Nuuts company we can significantly reduce costs for RDF. That is our aim to produce RDF with a cost as low as possible.

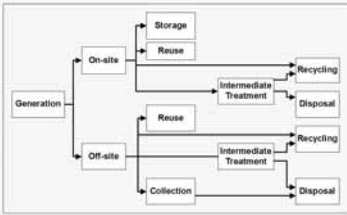







5 Shimura: *Shimurasan has explained how the boiler efficiency is calculated using power point slides.*



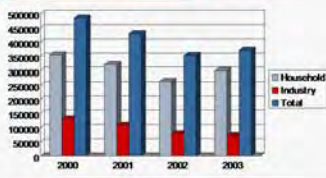



Batsaikhan: (Ministry of Environment) comments: Mongolia's main energy source is coal. That why it is important to reduce costs of coal consumption. The introduction of proposed fuel is a new idea and it is a step that has not been done before. Since all our power generating plants are designed to combust coal only, nothing has been done so far to improve their efficiency.


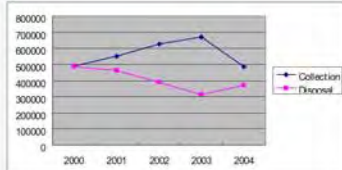
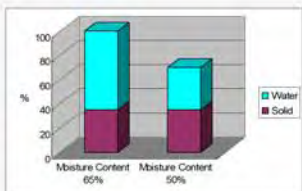
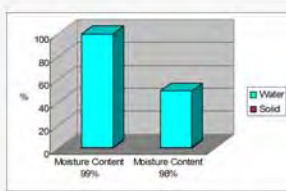
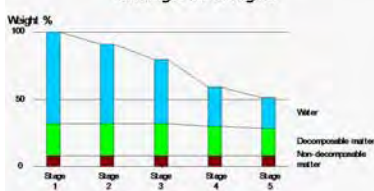
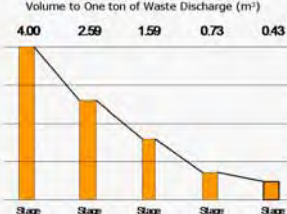

4.3 Technical Working Group Meetings

<div>First Weekly Meeting</div> <div>for THE STUDY ON SOLID WASTE MANAGEMENT PLAN FOR ULAANBAATAR CITY</div> <div>December 20, 2004 JICA Study Team</div>	<div>1. Work Progress (1)</div> <div><div><div></div></div><div>The report of the 1st Workshop is being compiled.</div><div><div></div></div><div>The preparatory work for the WACS is being conducted.</div><div><div></div></div><div>The preparatory work for the POS is being conducted.</div><div><div></div></div><div>The preparatory work for the local consultant' works is being conducted.</div></div>	<div>1. Work Progress (2)</div> <div>Works for Local Consultant</div> <div><div><div></div></div><div>Waste composition analysis</div><div><div></div></div><div>Public opinion survey</div><div><div></div></div><div>Topographic survey for the Ulaan Chuluut (UCDS) and Morin Daava disposal sites (MDDS)</div><div><div></div></div><div>Groundwater quality analysis of wells nearby UCDS and MDDS</div></div>												
<div>2. Works for the Following Week</div> <div><div><div></div></div><div>The report of the 1st Workshop will be completed.</div><div><div></div></div><div>Begin interviews with institutions (list attached)</div><div><div></div></div><div>WACS will start from Dec 22 and end 29.</div><div><div></div></div><div>Questionnaire of POS will be completed.</div><div><div></div></div><div>The preparatory work for the local consultant' works will be completed.</div></div>	<div>3. Subjects to be discussed</div> <div><div><div></div></div><div>Issues from the 1st Workshop</div><div><div></div></div><div>Contents and schedule of the WACS</div><div><div></div></div><div>Schedule of the POS</div><div><div></div></div><div>Area for topographical mapping</div><div><div></div></div><div>Wells for water sampling</div></div>	<div>Issues from the 1st Workshop (1)</div> <div><div><div></div></div><div>What should be the circulation for the First Workshop Report?</div><div><div></div></div><div>A number of additional types of SW were mentioned at the Workshop. How should these be dealt with in the Study?</div><div><div></div></div><div>Ger Area pit latrine waste. Frozen excrement from full pits is dug out and disposed of in public areas. Is this so widespread that a special collection service should be considered?</div><div><div></div></div><div>Picnic littering eg. in Tuul valley, is an increasing solid waste problem.</div><div><div></div></div><div>Urban livestock excrement in ger areas. Is this a serious problem?</div><div><div></div></div><div>There is a trend for "summer houses" to be increasingly occupied year round. Is this important enough for our summer-only fieldwork to be extended to them in the winter?</div></div>												
<div>First Weekly Meeting</div> <div>for THE STUDY ON SOLID WASTE MANAGEMENT PLAN FOR ULAANBAATAR CITY</div> <div>December 20, 2004 JICA Study Team</div>	<div>1. Work Progress (1)</div> <div><div><div></div></div><div>The report of the 1st Workshop is being compiled.</div><div><div></div></div><div>The preparatory work for the WACS is being conducted.</div><div><div></div></div><div>The preparatory work for the POS is being conducted.</div><div><div></div></div><div>The preparatory work for the local consultant' works is being conducted.</div></div>	<div>1. Work Progress (2)</div> <div>Works for Local Consultant</div> <div><div><div></div></div><div>Waste composition analysis</div><div><div></div></div><div>Public opinion survey</div><div><div></div></div><div>Topographic survey for the Ulaan Chuluut (UCDS) and Morin Daava disposal sites (MDDS)</div><div><div></div></div><div>Groundwater quality analysis of wells nearby UCDS and MDDS</div></div>												
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<div>Issues from the 1st Workshop (2)</div> <div><div><div></div></div><div>Involve related field staff in short and long-term waste management training programs conducted both domestically and abroad. => who, how, what subjects?</div><div><div></div></div><div>Implement a small scale project for supporting companies that deal with recycling and preparing secondary raw materials. => Is there more specific idea?</div></div>	<div>Issues from the 1st Workshop (3)</div> <div><div><div></div></div><div>There are many families who live in up in the mountains where the government services can not reach. => where?</div><div><div></div></div><div>There is a plan to create a final disposal area for dangerous chemical wastes at Takhir Soyot in Songinokhairkhan District. => where?</div><div><div></div></div><div>Waste recycling and treatment sites should be built in the middle of the Districts => Are there such sites available?</div><div><div></div></div><div>To make Sukhbaatar District Khoroo 13 the model area for the pilot project with a small project about reusing Ger area ash waste. => How?</div></div>	<div>Schedule and others of the WACS (1)</div> <table><tr><td>December, 2004</td><td><div><div></div></div><div>1-10: Explanation of the process/schedule of the site selection and report for the candidate sites by the Team</div><div><div></div></div><div>13-21: Selection of sampling area</div><div><div></div></div><div>22-29: Waste amount and composition survey</div></td></tr><tr><td>January, 2005</td><td><div><div></div></div><div>11-20: Presentation of the candidate sites by the Mongolian side</div><div><div></div></div><div>21-31: Collection of data and recommendation of the sites by the Team</div><div><div></div></div><div>21-31: Identification of waste flow</div></td></tr><tr><td>February, 2005</td><td><div><div></div></div><div>1-20: Screening of the sites by the Team</div><div><div></div></div><div>21-28: Presentation of the MPP alternatives by the Team => Approval of the alternatives to be examined by the SVC</div></td></tr><tr><td>March, 2005</td><td><div><div></div></div><div>Examination of the alternatives by the Team</div></td></tr><tr><td>April, 2005</td><td><div><div></div></div><div>1-10: 2nd Workshop => Recommendation of the optimum alternatives by the Workshop => Selection of the optimum one by the SVC</div><div><div></div></div><div>11-20: 1st Seminar => Consensus on the optimum alternative => Completion of site selection work</div></td></tr><tr><td>May, 2005</td><td><div><div></div></div><div>Formulation of a draft MPP and decision by the Team</div></td></tr></table>	December, 2004	<div><div></div></div> <div>1-10: Explanation of the process/schedule of the site selection and report for the candidate sites by the Team</div> <div><div></div></div> <div>13-21: Selection of sampling area</div> <div><div></div></div> <div>22-29: Waste amount and composition survey</div>	January, 2005	<div><div></div></div> <div>11-20: Presentation of the candidate sites by the Mongolian side</div> <div><div></div></div> <div>21-31: Collection of data and recommendation of the sites by the Team</div> <div><div></div></div> <div>21-31: Identification of waste flow</div>	February, 2005	<div><div></div></div> <div>1-20: Screening of the sites by the Team</div> <div><div></div></div> <div>21-28: Presentation of the MPP alternatives by the Team => Approval of the alternatives to be examined by the SVC</div>	March, 2005	<div><div></div></div> <div>Examination of the alternatives by the Team</div>	April, 2005	<div><div></div></div> <div>1-10: 2nd Workshop => Recommendation of the optimum alternatives by the Workshop => Selection of the optimum one by the SVC</div> <div><div></div></div> <div>11-20: 1st Seminar => Consensus on the optimum alternative => Completion of site selection work</div>	May, 2005	<div><div></div></div> <div>Formulation of a draft MPP and decision by the Team</div>
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<div><div>Schedule and others of the WACS (2)</div><div>Unit Generation Rate and Daily Waste Generation Amount</div><table><thead><tr><th>Discharge Source</th><th>Unit</th><th>Number of Discharge Source</th><th>Generation Ratio</th><th>Daily Generation Amount (ton/day)</th></tr></thead><tbody><tr><td>Household Waste</td><td>g/person/day</td><td></td><td></td><td>487</td></tr><tr><td>Commercial Waste (Restaurant)</td><td>g/table/day</td><td></td><td></td><td>1,664</td></tr><tr><td>Commercial Waste (Other Shop)</td><td>g/shop/day</td><td></td><td></td><td>4,502</td></tr><tr><td>Market Waste</td><td>g/stall/day</td><td></td><td></td><td>1,823</td></tr><tr><td>School Waste</td><td>g/student/day</td><td></td><td></td><td>20</td></tr><tr><td>Street Sweeping Waste</td><td>g/km/day</td><td></td><td></td><td>53,373</td></tr><tr><td>Hotel Waste</td><td>g/room/day</td><td></td><td></td><td>231</td></tr><tr><td>Office Waste</td><td>g/office/day</td><td></td><td></td><td>3,560</td></tr><tr><td colspan="4">Total</td><td></td></tr></tbody></table></div>	Discharge Source	Unit	Number of Discharge Source	Generation Ratio	Daily Generation Amount (ton/day)	Household Waste	g/person/day			487	Commercial Waste (Restaurant)	g/table/day			1,664	Commercial Waste (Other Shop)	g/shop/day			4,502	Market Waste	g/stall/day			1,823	School Waste	g/student/day			20	Street Sweeping Waste	g/km/day			53,373	Hotel Waste	g/room/day			231	Office Waste	g/office/day			3,560	Total					<div><div>Schedule and others of the WACS (3)</div><div>Current Waste Flow</div></div>	<div><div>Schedule and others of the WACS (4)</div><div>Examination of Alternatives</div></div>
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<div><div>Schedule and others of the WACS (5)</div><div>Future Waste Flow</div></div>	<div><div>Schedule of the POS</div><div><div>English questionnaire by December 20</div><div>Mongolia questionnaire will be delivered on December 22</div><div>Comments on questionnaire by December 25</div><div>Contract with a local consultant will be made by mid-January</div></div></div>	<div><div>Area for topographical mapping</div><div><div>Ulaan Chuluut Disposal Site: 40ha</div><div>Morin Davaa Disposal Sites: 40ha</div><div>Scale: 1/1,000</div><div>Contour interval: 1.0 meter</div></div><div>Note: The following information required:<div><div>Aerial photos of UCDS, MDSS and NADS</div><div>Boundary of UCDS, MDSS and NADS</div></div></div></div>																																																		
<div><div>Wells for water sampling</div><div><div>Ulaan Chuluut Disposal Site: 3 wells</div><div>Morin Davaa Disposal Sites: 3 wells</div><div>Other: 1 well</div></div><div>Note: The following information required:<div>Location of existing wells nearby UCDS and MDSS</div></div></div>																																																				
<div><div>Technical Working Group Meeting (2)</div><div>for THE STUDY ON SOLID WASTE MANAGEMENT PLAN FOR ULAANBAATAR CITY</div><div>December 24, 2004</div><div>JICA Study Team</div></div>	<div><div>1. Work Progress</div><div><div>The report of the 1st Workshop was completed and delivered to the member of the TWG.</div><div>The interviews with institutions were conducted.</div><div>The WACS was started from Dec 22.</div><div>The questionnaire of POS was completed.</div><div>The preparatory work for the local consultant' works was completed.</div></div></div>	<div><div>2. Works for the Following Week</div><div><div>The interviews with institutions will be continued.</div><div>WACS will be continued until 29. => come and see WACS</div><div>The questionnaire of POS will be finalized.</div><div>The tender for the local consultant' works will be conducted.</div><div>A web-site for the study will be set up.</div></div></div>																																																		
<div><div>3. Subjects to be discussed</div><div><div>Issues from the 1st Workshop</div><div>Establishment of Study Web-site</div><div>Questionnaire for POS</div><div>Survey on medical institutions & factories</div></div></div>	<div><div>Issues from the 1st Workshop</div><div><div>1. New illegal dumping areas are created because unauthorized transport companies dump waste at illegal spots. => where?</div><div>It is not clear who will / and how to dispose of industrial waste; causing organizations to throw dangerous solid and liquid wastes any where, thus polluting the environment</div><div>Apartment waste chutes emit very bad smell => Is it so?</div><div>Create a waste management fund complying with the law => What fund?</div><div>Ger area dams and storm-water drains are filled with waste => where?</div></div></div>	<div><div>Establishment of Study Web-site</div><div><div>Purpose: To introduce the details and results of the study, and planning and progress of the pilot project.</div><div>The setting up work will start from December 28 by Mr. Takasyo.</div><div>To whom and where Mr. Takasyo shall contact with.</div></div></div>																																																		
<div><div>Questionnaire for POS</div><div><div>Comments from the member of the Technical Working Group</div><div>Discussion of modification for finalization of the questionnaire</div></div></div>	<div><div>Survey on Medical Institutions</div><div><div>Purpose: To identify medical waste management focusing on infectious/hazardous wastes including their generation.</div><div>Schedule:<div><div>By Dec 31: Waste classification and lists of medical institutions</div><div>By Jan 7: Selection of the sample institutions and preparation of a draft questionnaire</div><div>By Jan 14: Survey will be started.</div></div></div></div></div>	<div><div>Survey on Factories (1)</div><div><div>Purpose: To identify industrial (factory) waste management focusing on hazardous wastes including their generation.</div><div>Schedule:<div><div>By Dec 31: Waste classification and lists of factories</div><div>By Jan 7: Selection of the sample factories and preparation of a draft questionnaire</div><div>By Jan 14: Survey will be started.</div></div></div></div></div>																																																		

<p>Survey on Factories (2)</p> 	<p>Information and Materials needed</p> <ul style="list-style-type: none"> □ List of factories (see list attached) □ List of medical institutions (see list attached) □ Existing study for medical waste management □ City plan for 2020 of English version 	
<p>Technical Working Group Meeting (3) for THE STUDY ON SOLID WASTE MANAGEMENT PLAN FOR ULAANBAATAR CITY</p> <p>January 7, 2005 JICA Study Team</p>	<p>1. Work Progress</p> <ul style="list-style-type: none"> □ The interviews with institutions were conducted. □ The WACS was completed on Dec 30 □ The study web-site was set up □ The questionnaire of POS was completed □ Tender for the local consultant work was completed and local consultants were selected. 	<p>2. Works for the Following Week</p> <ul style="list-style-type: none"> □ The interviews with institutions will be continued. □ Questionnaire for factory and medical survey will be finalized. □ Questionnaire for recycling market will be prepared. □ Public Opinion Survey will be commenced. □ Ground water analysis will be commenced. □ Topographical Survey for UC and MD Disposal site will be commenced □ The interviews with renovation company will be commenced
<p>3. Subjects to be discussed</p> <ul style="list-style-type: none"> □ The Study Web-site <ul style="list-style-type: none"> ■ http://www.ubservice.mn □ Location of Ground water analysis <ul style="list-style-type: none"> ■ 4 wells near UC, 2 near MD, 2 near Nalaikh □ Progress photo for WACS □ Time and Motion Survey 	<p>WACS-1 Ash from Ger Area</p> 	<p>WACS-2 Waste from Apartment</p> 
<p>WACS-3 Waste from school</p> 	<p>WACS-4 Quartering Method</p> 	<p>WACS-5 Physical Analysis</p> 
<p>WACS-6 Weighing</p> 	<p>WACS-7 Chemical Analysis</p> 	<p>Time and Motion Survey</p> <ul style="list-style-type: none"> □ Mr. Akira Doi in charge of the Survey □ Survey will be commenced from 17 Jan. 2005. □ Location of T & M Survey <ul style="list-style-type: none"> ■ Apartment Area ■ Ger Area ■ Summer House
<p>Information and Materials needed</p> <ul style="list-style-type: none"> □ List of factories □ List of medical institutions □ Location of Illegal Dumping □ City plan for 2020 of Mongolian Version in CD 		

<p>Technical Working Group Meeting (4) for THE STUDY ON SOLID WASTE MANAGEMENT PLAN FOR ULAANBAATAR CITY</p> <p>January 14, 2005 JICA Study Team</p>	<p>1. Work Progress</p> <ul style="list-style-type: none">□ The interviews with institutions were conducted.□ The result of WACS was analyzed□ Selection of medical institutions□ Briefing to interviewers for POS□ Interviews for 7 renovation companies and Nuuts□ Newsletter No1 was distributed	<p>Waste Chemical Analysis C/N Analysis</p> 																				
<p>Briefing to Interviewers</p> 	<p>Renovation Companies and Nuuts</p> 	<p>2. Works for the Following Week</p> <ul style="list-style-type: none">□ The results of WACS will be Analyzed.□ Questionnaire for Recycling Market will be finalized.□ POS will be commenced.□ Sampling of Ground Water near Disposal Sites.□ Topographical Survey for UC and MD Disposal site will be commenced□ Time and Motion Survey																				
<p>3. Subjects to be discussed</p> <ul style="list-style-type: none">□ T & M Survey□ Volume of Wastes disposed□ List of Medical institutions□ Others	<p>Time and Motion Survey</p> <ul style="list-style-type: none">□ Location<ul style="list-style-type: none">■ Chingeltei and Bayanzurkh District□ Schedule<ul style="list-style-type: none">■ 17 to 21 Jan 2005 : Chingeltei■ 24 to 28 Jan 2005 : Bayanzurkh□ Route	<p>Volume of Wastes disposed</p> <table><tr><th></th><th>Household, Dam, Road</th><th>Industry</th><th>Total (m3)</th></tr><tr><td>2000</td><td>353,400</td><td>130,620</td><td>484,020</td></tr><tr><td>2001</td><td>320,000</td><td>109,250</td><td>429,250</td></tr><tr><td>2002</td><td>262,650</td><td>77,388</td><td>352,500</td></tr><tr><td>2003</td><td>298,800</td><td>72,853</td><td>370,655</td></tr></table>		Household, Dam, Road	Industry	Total (m3)	2000	353,400	130,620	484,020	2001	320,000	109,250	429,250	2002	262,650	77,388	352,500	2003	298,800	72,853	370,655
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<p>Wastes disposed in UC & MD</p> 	<p>Medical Institution Survey</p> <ul style="list-style-type: none">□ State Service Hospital : 7□ District Service Hospital : 2□ Health Center : 2□ Family Hospital : 2□ Private Hospital : 2Total 15 Medical Institutions	<p>State Service Hospitals</p> <ol style="list-style-type: none">1. General Clinical Hospital2. Maternal and Child Health Research Center3. National Cancer Center4. National Center of Communicable Diseases5. Clinical Hospital of Traumatology and Rehabilitation6. Maternity Clinic Hospital 17. Clinical Hospital #3																				
<p>Information and Materials needed</p> <ul style="list-style-type: none">□ List of factories□ List of medical institutions□ Location of Illegal Dumping□ Comment on Recycling Market Survey	<p>Technical Working Group Meeting (5) for THE STUDY ON SOLID WASTE MANAGEMENT PLAN FOR ULAANBAATAR CITY</p> <p>January 21, 2005 JICA Study Team</p>	<p>1. Work Progress</p> <ul style="list-style-type: none">□ Analysis of WACS results□ POS in Households□ Medical Institutions Survey in State Service Hospitals□ Time and Motion Survey in Bayanzurkh District□ Quality Analysis of Ground Water□ Topographical Survey in UC																				
<p>POS in Ger Area</p> 	<p>Medical Institution Survey</p> 	<p>Storage of Health Care Wastes</p> 																				

<div>Time and Motion Survey</div> <div></div>	<div>2. Works for the Following Week</div> <div><ul style="list-style-type: none"><input type="checkbox"/> Analyzing of Waste Flow<input type="checkbox"/> POS for Organizations<input type="checkbox"/> Medical Institution Surveys for Small Hospitals<input type="checkbox"/> T & M Survey in Chingeltei<input type="checkbox"/> Quality analysis of ground water<input type="checkbox"/> Topographical Survey in MD<input type="checkbox"/> Survey for Final Disposal Amount</div>	<div>3. Subjects to be discussed</div> <div><ul style="list-style-type: none"><input type="checkbox"/> Collection and Disposal Amount<input type="checkbox"/> WACS Results<input type="checkbox"/> Others</div>																								
<div>Collection and Disposal Amount</div> <div><table><tr><th></th><th>Collection (m3)</th><th>Disposal (m3)</th><th>Disposal %</th></tr><tr><td>2000</td><td>492100</td><td>485000</td><td>98.5%</td></tr><tr><td>2001</td><td>552700</td><td>462400</td><td>83.7%</td></tr><tr><td>2002</td><td>628500</td><td>386900</td><td>61.6%</td></tr><tr><td>2003</td><td>672200</td><td>316000</td><td>47.0%</td></tr><tr><td>2004</td><td>484100</td><td>373100</td><td>77.1%</td></tr></table><div>Source : UB-XX Century and UBC</div></div>		Collection (m3)	Disposal (m3)	Disposal %	2000	492100	485000	98.5%	2001	552700	462400	83.7%	2002	628500	386900	61.6%	2003	672200	316000	47.0%	2004	484100	373100	77.1%	<div>Collection and Disposal</div> <div></div>	<div>WACS Results (next week)</div> <div><ul style="list-style-type: none"><input type="checkbox"/> What's Water Contents</div>
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<div><div>1.86 kg-H₂O/kg-Solid 1.00 kg-H₂O/kg-Solid</div></div>	<div><div>99 kg-H₂O/kg-Solid 49 kg-H₂O/kg-Solid</div></div>	<div>Sample data for Water Content</div> <div><table><tr><th></th><th>Stage</th><th>Water Content (%)</th><th>Decomposition rate of Organic matter (wt%)</th></tr><tr><td>1</td><td>Discharge</td><td>68</td><td>---</td></tr><tr><td>2</td><td>Collection</td><td>65</td><td>---</td></tr><tr><td>3</td><td>Final disposal</td><td>60</td><td>---</td></tr><tr><td>4</td><td>Half a year after final disposal</td><td>50</td><td>10</td></tr><tr><td>5</td><td>A year a after final disposal</td><td>45</td><td>15</td></tr></table></div>		Stage	Water Content (%)	Decomposition rate of Organic matter (wt%)	1	Discharge	68	---	2	Collection	65	---	3	Final disposal	60	---	4	Half a year after final disposal	50	10	5	A year a after final disposal	45	15
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<div>Technical Working Group Meeting (6)</div> <div>for THE STUDY ON SOLID WASTE MANAGEMENT PLAN FOR ULAANBAATAR CITY</div> <div>January 28, 2005</div> <div>JICA Study Team</div>	<div>1. Work Progress</div> <div><ul style="list-style-type: none"><input type="checkbox"/> Analysis of WACS results<input type="checkbox"/> POS for organization and enterprises<input type="checkbox"/> Medical Institutions Survey in small hospitals<input type="checkbox"/> Time and Motion Survey in Chingeltei District<input type="checkbox"/> Quality Analysis of Ground Water<input type="checkbox"/> Topographical Survey in MD<input type="checkbox"/> Survey for Final Disposal Amount</div>	<div>POS in Organization and Enterprises</div> <div></div>																								

Medical Institution Survey

Time and Motion Survey

Survey for Final Disposal Amount

2. Works for the Following Week

- Analyzing of Waste Flow
- Analyzing of POS results, Medical Institution Surveys results, and T & M Survey results,
- Factory Survey will be commenced.
- Recycling Market Survey will be commenced.

3. Subjects to be discussed

- WACS Results
- The transition of the parameter for Waste Flow
- Visit of Heat generation plants
- Others

WACS Results (Winter season) Generation rate (1) Household

Category	Unit	Average	Max	Min
Gar with collection	Cool ash	gperson/day	970	1,400
	General	gperson/day	100	300
	All	gperson/day	970	1,700
Gar without collection	Cool ash	gperson/day	700	1,300
	General	gperson/day	170	400
	All	gperson/day	870	1,600
Summer house	Cool ash	gperson/day	920	1,400
	General	gperson/day	100	300
	All	gperson/day	1,000	1,600
Apartment with dust chute	Cool ash	gperson/day	240	400
	General	gperson/day	270	600

Generation rate (2) Other source

Category	Unit	Average	Max	Min
Commercial	Restaurant	gperson/day	240	300
	Other shop	gperson/day	130	200
Institution	gperson/day	100	300	70
Market	gperson/day	1,000	1,300	100
Hotel	gperson/day	130	180	70
School	gperson/day	3.1	5.5	1.6
Road	gperson/day	3.1	3.4	2.6

Physical composition (wet base)

Classification	Wet ash	Plastic	Food	Textile	Other	Total
Gar with collection	26.0	22.9	2.7	0.0	10.9	62.5
Gar without collection	26.3	22.0	4.4	4.0	10.3	67.0
Summer house	34.4	3.4	0.4	0.1	10.3	48.6
Apartment with dust chute	27.3	0.9	2.4	1.1	30.1	61.8
Apartment without dust chute	40.0	0.4	0.3	1.0	1.7	43.4
Restaurant	41.0	0.7	0.5	0.2	1.6	43.0
Other shop	1.0	0.0	0.0	0.0	0.0	1.0
Market	1.0	0.0	0.0	0.0	0.0	1.0
Hotel	1.0	0.0	0.0	0.0	0.0	1.0
School	1.0	0.0	0.0	0.0	0.0	1.0
Road	1.0	0.0	0.0	0.0	0.0	1.0

Necessary Information for Estimated Generation

Category	Information
Household	Summer house: Whole Population (Statistical Hand book)
	Gar Area: No. of household (Statistical Hand book)
	Apartment: Household income, Estimated population
Commercial	Restaurant: No. of Restaurant, No. of Chairs and Employees of each all restaurants
	Other shop: No. of Other shop, No. of Employee
Public Institution, Office	No. of Institution and office, No. of Employee
Market	No. of Market, No. of shops
Hotel	No. of Hotel, No. of Bed, Employee and Floor Area
School	No. of School, No. of Student, teachers and staff for every school
Road Cleaning	Area and Length of road cleaning

Survey for Final Disposal Amount

Recycling Company	No.	Model of vehicles	Waste weight (kg)	Volume (m ³)	Specific gravity (ton/m ³)
Saitwater Recycling Company	1	Mitsubishi	not yet	not yet	—
	2	Isuzu	2,200	11.5	0.19
	3	Isuzu	2,200	10.0	0.22
	4	Isuzu (dump truck)	not yet	not yet	—
Bayankhishig Recycling Company	5	Mitsubishi	1,600	9.8	0.17
	6	Isuzu	2,000	9.6	0.20
	7	Isuzu (4 m ³)	2,000	7.5	0.31
	8	Isuzu (4 m ³)	1,800	3.7	0.49
	9	Isuzu (3 m ³)	1,400	4.2	0.35
	10	Isuzu	not yet	not yet	—
Chinggis Recycling Company	11	Isuzu	2,200	5.5	0.40
	12	SA-3200	7,500	21.7	0.35

Waste flow

Information and Materials needed

- List of factories
- List of medical institutions
- Comment on Recycling Market Survey

Technical Working Group Meeting (7) for THE STUDY ON SOLID WASTE MANAGEMENT PLAN FOR ULAANBAATAR CITY

February 4, 2005
JICA Study Team

1. Work Progress

- POS for organization and enterprises
- Recycling Market Survey
- Factory Survey
- Analysis of WACS results
- Analysis of Medical Institution Survey results
- Analysis of Time and motion Survey results
- Analysis of Waste Flow
- Visited Heat generation plant and No.3 Power Plant

Heat Generation Plant (Khoroo No.6 Songinokhairkhan district Heating Plant No.9)

Recycling Market Survey Plastics Exporting Company

Recycling Market Survey Plastics Recycling Plant

2. Works for the Following Week

- Analyzing of Waste Flow
- Analyzing of POS results, and Medical Institution Surveys results,
- Factory Survey
- Recycling Market Survey

3. Subjects to be discussed

- WACS Results (2)
- Time and motion results
- The transition of the parameter for Waste Flow
- Target factory and Recycling Market list
- Others

WACS Results (Winter season) (2) Apparent Specific Gravity

Generation Source	Average	Maximum	Minimum
Ger area			
Ger area with collection	0.11	0.12	0.07
Ger area without collection	0.09	0.13	0.05
Summer house area	0.11	0.15	0.05
Apartment area			
Apartment area with dust chute	0.10	0.15	0.05
Apartment area without dust chute	0.11	0.17	0.03
Commercial			
Restaurant	0.21	0.32	0.12
Other shop	0.05	0.09	0.03
Institution			
Market 1	0.07	0.11	0.03
Market 2			
Meat	0.21	0.39	0.04
Vegetable	0.19	0.43	0.03
Fruit	0.07	0.25	0.02
Dairy product	0.04	0.07	0.02
Other	0.02	0.04	0.01
House			
School	0.06	0.11	0.03
Street cleaning	0.05	0.07	0.03
Road cleaning	0.07	0.10	0.03

Three Component Analysis

Classification	Category	Unit: wet %			
		Moisture	Combustible	Ash	Total
Kitchen waste	Apartment without dust chute	58.4	27.3	30.3	100.0
	Market - Fruit shop	54.5	23.3	12.2	100.0
	Market - Vegetable shop	52.1	19.7	28.2	100.0
	Restaurant	43.8	40.0	15.4	100.0
Paper	Apartment without dust chute	26.9	60.0	13.2	100.0
	Market - Fruit shop	35.4	56.1	8.5	100.0
	Restaurant	27.1	52.3	19.6	100.0
	Greenhouse	24.3	66.4	19.4	100.0
Textiles	Apartment without dust chute	14.0	47.4	38.6	100.0
	Market - Fruit shop	11.9	75.9	12.2	100.0
	Market - Vegetable shop	42.8	11.4	45.7	100.0
	Restaurant	2.5	69.1	28.4	100.0
Plastics	Market - Vegetable shop	17.6	9.4	73.0	100.0
	Restaurant				

Carbon and Nitrogen analysis

Classification	Carbon dry %	Nitrogen dry %	C/N (-)
Apartment without dust chute	42.6	3.0	14
Ger area with Collection	67.6	0.5	135
Market Fruit	54.9	0.2	366
Market Vegetable	31.9	3.2	10
Restaurant	39.5	3.0	13

Comparison of Generation of Household Waste in the Study Area and Other Study Generation rate

Country	City	Year	Population	Household waste (g/person/day)
Mongolia	Ulaanbaatar	2004	869,912	210 (without ash) 560 (with ash) * Weight average
Cambodia	Phnom Penh	2003	1,109,414	487
Azerbaijan	Baku	1999	2,025,300	246
Turkey	Ankara	1999	1,196,620	473
Turkey	Istanbul	1999	614,050	439
Tanzania	Dares Salaam	1996	2,030,230	698
Nicaragua	Managua	1994	834,427	664
Paraguay	Asuncion	1993	506,445	951
Philippines	Manila	1992	590,500	654
Poland	Lublin	1992	362,500	400
Laos	Vientiane	1991	142,700	753
Malaysia	Pulau Pinang	1988	559,300	904

Time and motion results

The transition of the parameters for Waste flow

- The reference of the population projection
- Waste collection rate
- Target percentage for household in Collection area
- Target percentage for household in Non collection area
- Target percentage for other than household waste
- Intermediate Treatment Amount
- Street waste picking Amount
- Recycling amount in Disposal site
- Road cleaning Waste etc.

Target factory and Recycling Market List

Please show Attached list

Information and Materials needed

- List of factories
- Information of The population projection

Technical Working Group Meeting (8) for THE STUDY ON SOLID WASTE MANAGEMENT PLAN FOR ULAANBAATAR CITY

February 18, 2005
JICA Study Team

1. Work Progress

- Analysis of POS results
- Analysis of waste flow
- Analysis of medical institution survey results
- Analysis of recycling market survey results
- Factory Survey
- Study on candidate sites for landfill
- Inspection on the WACS of medical institution being conducted by the MOH/WHO
- Data collection from district offices

Inspection on the WACS of medical institution being conducted by the MOH/WHO

Clinical Hospital of Traumatology & Rehabilitation

Forensic Hospital

2. Works for the Following Week

- Analyzing of POS results
- Analyzing of waste flow
- Factory survey
- Study on candidate sites for landfill
- Data collection from district offices

3. Subjects to be discussed

- Schedule of site selection and pilot project
- Interim report on waste generation of municipal solid waste amount of municipal solid waste
- Others

3.1 Schedule of site selection and pilot project - Schedule of site selection and master plan formulation

Date	Event
Dec, 2004	1-10: Explanation of the procedure/schedule of the site selection and request for the candidate sites by the Team
11-20	Presentation of the candidate sites by the Mongolian side
Jan, 2005	21- 31: Collection of data and reconnaissance of the sites
Feb, 2005	1-20: Screening of the sites by the Team 21-28: Presentation of the M/P alternatives by the Team => Approval of the alternatives to be examined by the S/C
Mar, 2005	Examination of the alternatives by the Team 1-10: 2nd Workshop => Recommendation of the optimum alternative by the Workshop => Selection of the optimum one by the S/C
Apr, 2005	11-20: 1st Seminar => Consensus on the optimum alternative => Completion of site selection work
May, 2005	Formulation of a draft M/P and discussion by the Team

3.1 Schedule of site selection and pilot project - Schedule of pilot project

3.1 Schedule of site selection and pilot project - Schedule of pilot project

- What we should decide for smooth implementation of the pilot project for the improvement of the landfill.
- Can the UCDS be used as the landfill for 6 districts for some years?
- If yes, when we could get the approval of further use?
- If no, what landfill we shall improve?

Waste generation amount of municipal solid waste (draft)

Waste Type	Unit	Number of Generation Sources	Generation Rate	Generation Amount (ton/day)
Household Waste	Apartment area	g/person/day	424,679	256
	Ger area	g/person/day	418,337	163
	Greenhouse	g/person/day	418,337	788
Commercial Waste	Restaurant	g/person/day	41,812	250
	Other shop	g/person/day	3,009	1,200
Market Waste	g/person/day	4,354	850	
School Waste	g/person/day	271,379	9	
Hotel Waste	g/person/day	11,506	130	
Office Waste	g/person/day	105,376	130	
Road cleaning Waste	g/m ² /day	2,662,662	3	
Total				549

In order to finalize the generation amount, the following data be confirmed (see Handout)

- Population data
- Number of Restaurant
- Number of Shop
- Number of Market
- Number of School
- Number of Hotel
- Number of Institution (Office)
- Area of Road cleaning

Technical Working Group Meeting (9)

for THE STUDY ON SOLID WASTE MANAGEMENT PLAN FOR ULAANBAATAR CITY

February 25, 2005
JICA Study Team

1. Work Progress

- Analysis of POS results
- Analysis of waste flow
- Factory Survey
- Study on candidate sites for landfill
- Plan of pilot project for the improvement of UCDS
- Data collection from district offices

2. Works for the Following Week

- Analysis of POS results
- Analysis of waste flow
- Analysis of factory survey results
- Study on candidate sites for landfill
- Plan of pilot project for the improvement of UCDS
- Study of financial system on SWM
- Data collection from district offices

3. Subjects to be discussed

- Draft waste flow
- Draft report of recycling market survey
- Draft report of medical institution survey
- Others if any

Draft Waste Flow in 2005

The flowchart illustrates the waste management process in 2005. It starts with 'Private' and 'Govt' waste sources, which flow into 'Collection' and 'Transfer' stages. These then lead to 'Landfill' and 'Recycling' stages. The 'Recycling' stage is further divided into 'Paper waste', 'Plastic waste', 'Metal waste', and 'Glass waste'. The 'Landfill' stage is also divided into 'Paper waste', 'Plastic waste', 'Metal waste', and 'Glass waste'. The final output is 'Waste disposal'.

Draft report of Recycling Market Survey

Recycling Market Survey

No	Name of Company	Type of Company
1	"Sudalt" Co.,Ltd	Supplier
2	Chimgee/ Bumbugur/	Supplier
3	Uranchimeg/ Naranzul	Supplier
4	Shinetseng/ Tsaiiz	Supplier
5	Nadmid /Bars/	Supplier
6	"Noosimpex" Co.,Ltd	Toilet paper
7	"Trade & printing Company Mongol Kheviel" Co.,Ltd	Polyethylene bag
8	Onon Nomin Co.,Ltd	Polyethylene bag
9	Puma Service Co.,Ltd	Exporter

Another target : 2 Waste picker

No of Company	1	2	3	4	5	6	7	8	9	Total
Paper waste		45				600				645
Plastics	825	100	105	85	74		48	280	1,000	2,517
Metal	9,225	45	40	275	200				700	10,485
Glass (bottles)	1,310	275	350	325	325					2,525
Others (Accumulator)	125									125
Sub-total	11,425	465	495	685	599	600	48	280	1,700	16,297

Paper waste : Office paper, Cardboard, etc.
Plastics : PET bottles, Plastic container, Plastic bag
Metal : Aluminium, Iron, Copper, Lead, etc.
Glass : Bottles

Draft report of Medical Institution Survey

Medical Institution Survey

No.	Name of the medical institution	Number of Beds	Employee
1	I Hospital	544	597
2	Maternal and Child research center	658	990
3	I Maternity hospital	240	248
4	Forensic research centre	No answer	70
5	III Hospital	400	523
6	Puma hospital (private)	90	100
7	Central trauma hospital	420	420
8	Cancer research centre	190	328
9	National centre for communicable diseases	610	800
10	Bayanzurkh district hospital	200	131
11	Bayanzurkh district health centre	No answer	195
12	Sukhbaatar district health centre	No answer	150
13	Chingelher district hospital	167	No answer
14	State dental centre	0	65
15	Yonsei friendship hospital	No answer	61

Generation Rate of General Waste

No.	Generation Amount	kg/bed/day	kg/employee/day
1	285.7	0.53	0.48
2	1,800.0	2.74	1.82
3	100.0	0.42	0.40
4	4.3	---	0.06
5	No answer	---	---
6	No answer	---	---
7	No answer	---	---
8	1,285.7	8.77	3.92
9	142.9	0.23	0.18
10	91.4	0.46	0.70
11	34.3	---	0.18
12	22.9	---	0.15
13	42.3	0.25	---
14	4.0	---	0.06
15	91.4	---	---

Generation of Medical Waste (Hazardous/Infectious) in Each Medical Institution

No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1 Infectious waste	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
2 Pathological waste	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3 Sharps	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
4 Pharmaceutical waste	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
5 Genotoxic waste	x														
6 Chemical waste	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
7 Residue with high content of heavy metals	x														
8 Pressurized containers	x														
9 Radioactive waste	x														

Generation Rate of Medical Waste

No.	Generation Amount	kg/bed/day	kg/employee/day
1	142.9	0.263	0.239
2	1.4	0.002	0.001
3	-	-	-
4	3.1	-	0.044
5	-	-	-
6	32.0	0.356	0.320
7	-	-	-
8	110.9	0.584	0.338
9	2.6	0.004	0.003
10	-	-	-
11	0.9	-	0.005
12	-	-	-
13	0.3	0.002	-
14	38.4	-	0.591
15	4.3	-	0.070


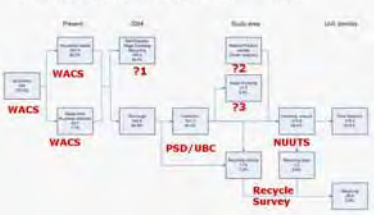
4. Information and Materials needed

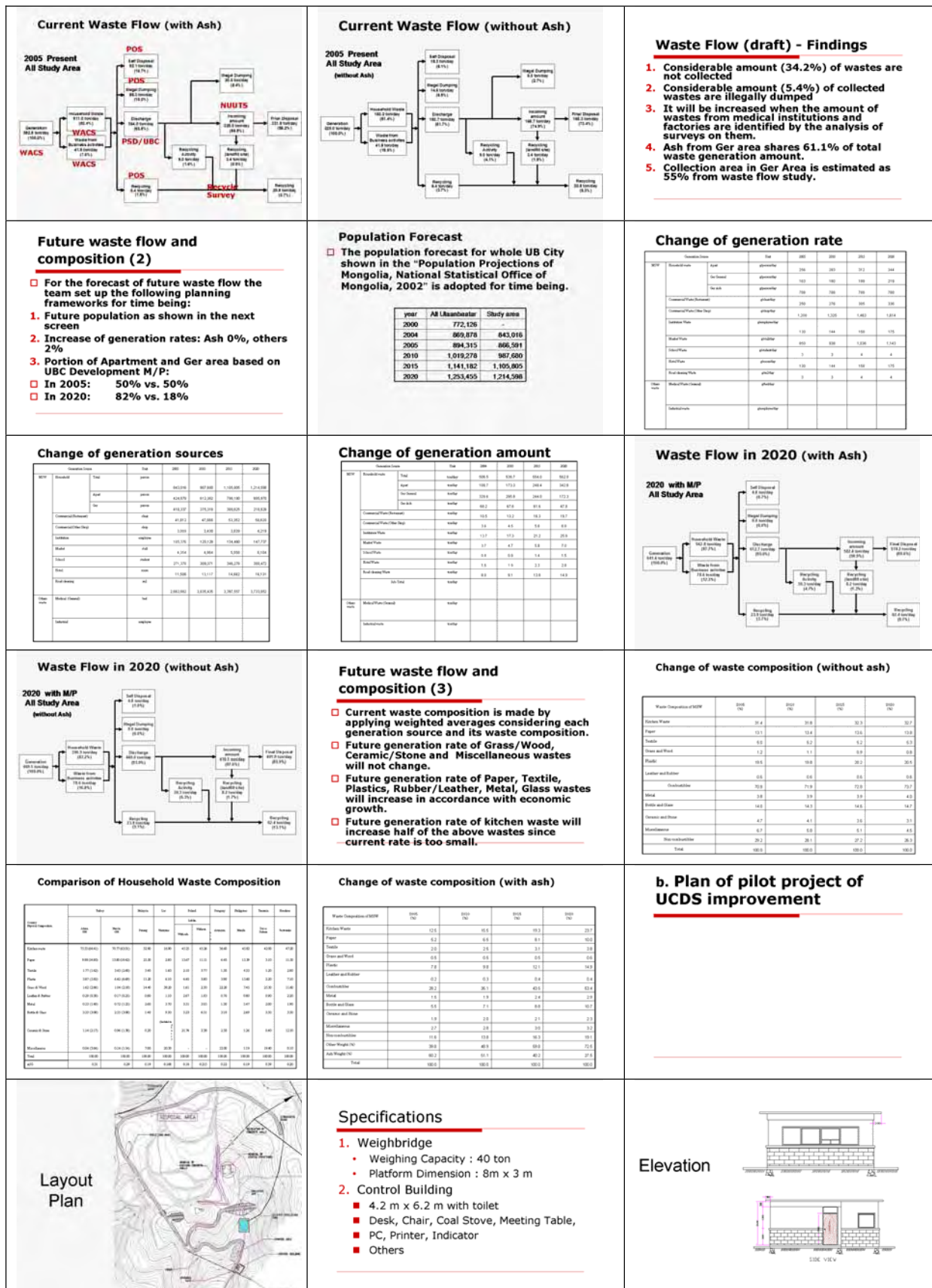
- Geological data on UCDS

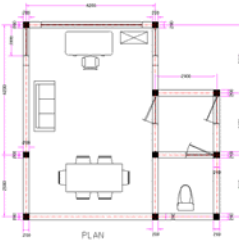






5. Others

- Mr. Mori will arrive on February 27.
- Mr. Suzuki will leave on February 27.
- Mr. Kono will arrive on March 1.

4-135

<p>Technical Working Group Meeting (11) for THE STUDY ON SOLID WASTE MANAGEMENT PLAN FOR ULAANBAATAR CITY</p> <p>March 11, 2005 JICA Study Team</p>	<p>1. Work Progress</p> <ul style="list-style-type: none"> Analysis of POS results Analysis of waste flow Analysis of factory survey results Study on candidate sites for landfill Alternative study for the master plan (M/P) Plan of pilot projects Study of financial system on SWM Data collection from district offices 	<p>2. Works for the Following Week</p> <ul style="list-style-type: none"> Analysis of POS results Analysis of waste flow Analysis of factory survey results Study on 6 candidate sites for future landfill Alternative study for formulation of master plan Plan of pilot project of UCDS improvement Study of financial system on SWM Study of the garages of 7 TUKs
<p>3. Subjects to be discussed</p> <ul style="list-style-type: none"> Study on 6 candidate sites for future landfill Alternative study for formulation of master plan Arrangement of visit to the garages of 7 TUKs and Nuuts for Mr. Takeishi Arrangement of meetings with collection service enterprises other than TUKs for Mr. Doi Status of waste fund 	<p>a. Environmental study on 6 candidate sites for future landfill</p> <p>The objectives of the study are:</p> <ul style="list-style-type: none"> To collect the existing data on environmental aspects of the six candidate disposal sites; and To prepare a comparison table of the six candidates for future landfill regarding environmental aspects (see the Appendix delivered) in order to select an optimum site through the alternative study to be conducted by the JICA Study Team. <p>In order to pursue the following works will be conducted:</p> <ul style="list-style-type: none"> Field reconnaissance (FR); and Literature study (LS) including collection of available data 	<p>b. Alternative study for formulation of master plan</p> <ul style="list-style-type: none"> Based on the six candidate sites, the six alternatives that are the combinations of collection, transportation and final disposal will be examined. The transfer system (with transfer station, etc.) will be examined for the candidate site of which distance from the city center is more than 20 km. Introduction of intermediate treatment system (processing including recycling) will be examined separately. 
<p>c. Arrangement of visit to the garages of 7 TUKs and Nuuts for Mr. Takeishi</p> <ul style="list-style-type: none"> Mr. Takeishi is the expert of vehicles and equipment maintenance. The purposes of the visit are: <ol style="list-style-type: none"> To evaluate current maintenance capabilities of collection vehicles and equipment of TUKs and Nuuts; and To find out measures to improve maintenance capabilities of them. 	<p>d. Arrangement of meetings with collection service enterprises other than TUKs for Mr. Doi</p> <ul style="list-style-type: none"> The purpose of the meetings is to understand what kinds of activities such enterprises doing. At first the team needs a list of such enterprises if available. 	<p>e. Status of waste fund</p> <ul style="list-style-type: none"> Who is examining the waste fund system? How is the examination work doing?
<p>4. Information and Materials needed</p> <ul style="list-style-type: none"> Lists of registered collection service enterprises other than TUKs 		
<p>Technical Working Group Meeting (12) for THE STUDY ON SOLID WASTE MANAGEMENT PLAN FOR ULAANBAATAR CITY</p> <p>March 18, 2005 JICA Study Team</p>	<p>1. Work Progress</p> <ul style="list-style-type: none"> Analysis of POS results Analysis of waste flow Analysis of factory survey results Study on 6 candidate sites for future landfill Alternative study for formulation of master plan Plan of pilot project (PP) of UCDS improvement Plan of other PPs other than UCDS improvement Study of financial system on SWM Study of the garages of 7 TUKs 	<p>2. Works for the Following Week</p> <ul style="list-style-type: none"> Analysis of POS results Analysis of waste flow Analysis of factory survey results Study on 6 candidate sites for future landfill Alternative study for formulation of master plan Plan of pilot project (PP) of UCDS improvement Plan of other PPs other than UCDS improvement Study on collection service enterprises other than TUKs Study of financial system on SWM Study of the garages of 7 TUKs
<p>3. Subjects to be discussed</p> <ul style="list-style-type: none"> Future waste flow and composition Plan of pilot project of UCDS improvement Comparison of waste fee and waste tax 	<p>a. Future waste flow and composition (1)</p> <ul style="list-style-type: none"> The previous waste flow in 2005 was modified based on the analysis of POS results, i.e. ?1 in the next screen. However, ?2 and ?3 are not identified yet. The Team shall continue the analysis of the results of medical institution survey and factory survey. The current waste flow presented shall be revised when the Team complete the above surveys as well as WACS in summer. However, the Team has to forecast the future waste flow based on the presented one in order to conduct the alternative study for the site selection of future landfill. 	<p>Method of Waste Flow Estimation</p> 



<p>PLAN</p> 	<p>c. Comparison of waste fee and waste tax</p> <ul style="list-style-type: none"> Mr. Mori will explain the advantages and disadvantages of waste fee and tax systems in accordance with the Appendix 1. Then he would like to receive your opinion. 	<p>4. Information and Materials needed</p> <ul style="list-style-type: none"> Existence of a garage or a maintenance shop of Ulaanbaatar Municipality List of heavy and light equipment other than collection vehicles of TUKs List of maintenance tools of TUKs
<p>Technical Working Group Meeting (13) for THE STUDY ON SOLID WASTE MANAGEMENT PLAN FOR ULAANBAATAR CITY</p> <p>March 25, 2005 JICA Study Team</p>	<p>1. Work Progress</p> <ul style="list-style-type: none"> Analysis of POS results Analysis of waste flow Analysis of factory survey results Study on 6 candidate sites for future landfill Alternative study for formulation of master plan Plan of pilot project (PP) of UCDS improvement Plan of other PPs other than UCDS improvement Study of financial system on SWM and waste fund Study of the garages of 7 TUKs 	<p>2. Works for the Following Week</p> <ul style="list-style-type: none"> Analysis of waste flow Analysis of factory survey results Study on 6 candidate sites for future landfill Alternative study for formulation of master plan Plan of pilot project (PP) of UCDS improvement Plan of other PPs other than UCDS improvement Social environment survey around present disposal sites Study on collection service enterprises other than TUKs Study of financial system on SWM
<p>3. Subjects to be discussed</p> <ol style="list-style-type: none"> Schedule of the second workshop and third steering committee meeting Results of time & motion survey Problems related to the current fee collection and measures to be taken 	<p>a. Schedule of the second workshop and third steering committee meeting</p> <ul style="list-style-type: none"> The purpose of the workshop (2) and 3rd St/C is to select future final disposal site(s) and possible intermediate treatment system. Proposed schedule: <ol style="list-style-type: none"> Workshop (2): April 7 (Th): 5 candidate sites visit, April 8 (Fr): Discussion 3rd St/C: one day of April 11-15 	<p>b. Results of time & motion survey</p> <p>Main Findings</p>
<p>Survey</p> <ul style="list-style-type: none"> Survey Period <ul style="list-style-type: none"> From 17 January till 28 January Survey Sites <ul style="list-style-type: none"> Byanzurukh <ul style="list-style-type: none"> Apartment: 2 khoroo Gel: 3 khoroo Chingeltei <ul style="list-style-type: none"> Apartment: 2 khoroo Gel: 3 khoroo <p>2007/2/6 JICA Study Team 7</p>	<p>Collection System</p> <ul style="list-style-type: none"> Bell collection Apartment with dust chute Communal container collection No proper collection system Ger area collection 	<p>Apartment: Bell Collection</p>  <ul style="list-style-type: none"> When the truck come, it made horn to inform of its arriving. Then people carry their garbage to the truck. Cleaners and guards mainly carry garbage. This system is well functioning.
<p>Apartment: Dust Chute Collection</p>  <ul style="list-style-type: none"> Garbage Collection after 1 month. Nobody notice it full. Chute often clogs. Garbage often burn both in the chamber and in the chute. Very difficult to load garbage to the truck. Very unsanitary. It is very convenient system for residents, but nobody care garbage after dropping it to the chute. Dust chute should be banned! 	<p>Apartment: Communal Container Collection System</p>  <ul style="list-style-type: none"> Nobody take care public containers due to no ownership feeling. Garbage can't drop to the truck due to being frozen. Waste pickers scatter garbage to collect cans and plastic bottles. People burn garbage in containers for warming. Wheels and a cover are easily damaged. Using communal container for Apartment should be banned! This system is suitable for business waste. 	<p>Apartment: No Discharge & Collection Rule</p>  <ul style="list-style-type: none"> Waste scattered due to no garbage storage system. Unsanitary Difficult to collect garbage.
<p>Ger Area: Fee Collection</p> 	<p>Ger Area</p> <ul style="list-style-type: none"> People are responsible for loading their garbage. Good public cooperation. Cover garbage with sheet to prevent waste scattering. Many people cooperate for loading garbage. 	<p>In Tokyo Garbage Discharge System</p> 