PREPARATORY SURVEY
FOR
INTEGRATED SOLID WASTE MANAGEMENT
IN NAIROBI CITY
IN
THE REPUBLIC OF KENYA

FINAL REPORT

VOLUME 4

DATA BOOK

SECTION D

3R AND INTERMEDIATE TREATMENT

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1. Questionnaires to Middlemen/Brokers in the Dandora Dumpsite

QUESTIONNAIRES TO MIDDLEMANS/BROKERS IN DANDORA DUMP SITE
(Survey Date: 6th – 20th April 2010)

1.1 Name of Broker/Group/CBO		ERIC GICHURU		
1.2 Name of Person Reply to the Questionnaires		ERIC GICHURU	1.3 position	BUSINESSMAN
1.4 Location/Address of Business		DANDORA AND KAYOLE DUMP SITES		
1.5 Telephone Number		0724323809		
1.6 Registration (License) No.	NONE	1.7 Number of Employees/Staff	SOLE	
1.8 How many waste pickers supply recyclables to you?		100		
1.9 Working Lot Area (m^2)		80 × 100M		
1.10 What are the major recyclable materials handled?		PLASTIC BAGS,PET BOTTLES		

1.11 Handling Quantity of Recyclables per Month and Average Unit Price of Recyclables

Name of Recyclables	Average Unit price of recyclables (Ksh/kg)		Handling Weight of Recyclables per Month (kg/Month)
	Buying Price	Selling Price	
Year 2010	Ksh.	Ksh.	
PET Bottles	6	12	3,000
Other Plastics	8	12	3,000
Carton			
Other Papers			
Bottles/Glass			
Tin & Cans			
Scrap Iron			
Aluminum Cans			
Aluminum			
Copper			
Others-1（ ）			

1.12 Name of Brokers・Factory Handling your Recyclable Material
Name of Buying Broker :ERIC GICHURU
Name of Selling Broker :
Name of Selling Factory :

1.13 Do you have an expansion plan of your business? Yes___X___No_____ If "NO", Please state your reasons (i.e cost, incentive, marketing and others)

1.14 When did you start the activities?	2005
1.15 What was the main reason to start the activities?	AS A SOURCE OF INCOME
1.16 What are the issues to continue/sustain the activities?	DELAY IN PURCHASE BY THE MARKET WHICH ONLY BUYS WHEN PREVIOUS STOCK IS CLEARED.

Thank you very much for your cooperation for the survey.
JICA Survey Team for Preparatory Survey for Integrated Solid Waste Management in Nairobi City
Department of Environment, City Council of Nairobi
National Environment Management Authority

QUESTIONNAIRES TO MIDDLEMANS/BROKERS IN DANDORA DUMP SITE
(Survey Date: 6th-20th April 2010)

1.1 Name of Broker/Group/CBO	FRANCIS MWAURA		
1.2 Name of Person Reply to the Questionnaires	FRANCIS MWAURA	1.3 position	
1.4 Location/Address of Business	DANDORA DUMP SITE		
1.5 Telephone Number	0716818376		
1.6 Registration (License) No.		1.7 Number of Employees/Staff	1
1.8 How many waste pickers supply recyclables to you?	30		
1.9 Working Lot Area (m^2)			
1.10 What are the major recyclable materials handled?	SHOE SOLES		

1.11 Handling Quantity of Recyclables per Month and Average Unit Price of Recyclables

Name of Recyclables	Average Unit price of recyclables (Ksh/kg)		Handling Weight of Recyclables per Month (kg/Month)
	Buying Price	Selling Price	
Year 2010	Ksh.	Ksh.	
PET Bottles			
Other Plastics			
Carton			
Other Papers			
Bottles/Glass			
Tin & Cans			
Scrap Iron			
Aluminum Cans			
Aluminum			
Copper			
Shoe soles	15	25	700
Others-1（ ）			

1.12 Name of Brokers・Factory Handling your Recyclable Material
Name of Buying Broker : FRANCIS MWAURA
Name of Selling Broker :
Name of Selling Factory : TOPEN INDUSTRIES

1.13 Do you have an expansion plan of your business? Yes__X____No_____ If “NO”, Please state your reasons (i.e cost, incentive, marketing and others)

1.14 When did you start the activities?	2009
1.15 What was the main reason to start the activities?	AS A LIVELIHOOD
1.16 What are the issues to continue/sustain the activities?	AVAILABILITY OF MATERIALS

Thank you very much for your cooperation for the survey.
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Department of Environment, City Council of Nairobi
National Environment Management Authority

QUESTIONNAIRES TO MIDDLEMANS/BROKERS IN DANDORA DUMP SITE
(Survey Date: 6th-20th April 2010)

1.1 Name of Broker/Group/CBO		KAMANDE MWAURA		
1.2 Name of Person Reply to the Questionnaires		KAMANDE MWAURA	1.3 position	BUSINESSMAN
1.4 Location/Address of Business		DANDORA DUMP SITE		
1.5 Telephone Number		0721276482		
1.6 Registration (License) No.	NONE	1.7 Number of Employees/Staff	SOLE	
1.8 How many waste pickers supply recyclables to you?		50		
1.9 Working Lot Area (m^2)		100 × 150M		
1.10 What are the major recyclable materials handled?		CARTON,PLASTIC,TINS,BONES,BOTTLES		

1.11 Handling Quantity of Recyclables per Month and Average Unit Price of Recyclables

Name of Recyclables	Average Unit price of recyclables (Ksh/kg)		Handling Weight of Recyclables per Month (kg/Month)
	Buying Price	Selling Price	
Year 2010	Ksh.	Ksh.	
PET Bottles	6	8	3,000
Other Plastics	8	12	2,000
Carton	2	3.50	10,000
Other Papers			
Bottles/Glass	1	1.50	2,000
Tin & Cans	10	13	1,000
Scrap Iron			
Aluminum Cans			
Aluminum			
Copper			
Bones	2	4	1,500
Others-1（ ）			

1.12 Name of Brokers・Factory Handling your Recyclable Material
Name of Buying Broker : KAMANDE MWAURA
Name of Selling Broker :
Name of Selling Factory :

1.13 Do you have an expansion plan of your business? Yes__X____No_____ If “NO”, Please state your reasons (i.e cost, incentive, marketing and others)

1.14 When did you start the activities?	2008
1.15 What was the main reason to start the activities?	SOURCE OF INCOME
1.16 What are the issues to continue/sustain the activities?	• NOT KNOWN AT THE MARKET HENCE MUST USE A BROKER • LOW BUYING PRICE FROM BROKER

Thank you very much for your cooperation for the survey.
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Department of Environment, City Council of Nairobi
National Environment Management Authority

QUESTIONNAIRES TO MIDDLEMANS/BROKERS IN DANDORA DUMP SITE
(Survey Date: 6th-20th April 2010)

1.1 Name of Broker/Group/CBO		DANIEL MWAURA		
1.2 Name of Person Reply to the Questionnaires		DANIEL MWAURA	1.3 position	BUSINESSMAN
1.4 Location/Address of Business		DANDORA DUMP SITE		
1.5 Telephone Number		073275250		
1.6 Registration (License) No.	NONE	1.7 Number of Employees/Staff	SOLE	
1.8 How many waste pickers supply recyclables to you?		20-50		
1.9 Working Lot Area (m^2)		30 × 60M		
1.10 What are the major recyclable materials handled?		RETURNABLE BOTTLES,PLASTICS,PET BOTTLES		

1.11 Handling Quantity of Recyclables per Month and Average Unit Price of Recyclables

Name of Recyclables		Average Unit price of recyclables (Ksh/kg)		Handling Weight of Recyclables per Month (kg/Month)
		Buying Price	Selling Price	
Year 2010		Ksh.	Ksh.	
PET Bottles		5-6	8	2,000-3,000
Other Plastics		8	12	4,000-5,000
Carton				
Other Papers				
Bottles/Glass				
Tin & Cans				
Scrap Iron				
Aluminum Cans				
Aluminum				
Copper				
Returnable bottles	Beer bottles	7-beer bottle,5-soda bottle	12-beer,8-soda	1,000 returnable bottles
Others-1（ ）				

1.12 Name of Brokers・Factory Handling your Recyclable Material
Name of Buying Broker : DANIEL MWAURA
Name of Selling Broker :
Name of Selling Factory : JACK TRADERS

1.13 Do you have an expansion plan of your business? Yes__X____No_____ If "NO", Please state your reasons (i.e cost, incentive, marketing and others)

1.14 When did you start the activities?	2004
1.15 What was the main reason to start the activities?	SOURCE OF INCOME
1.16 What are the issues to continue/sustain the activities?	• LOW BUYING PRICE FROM BROKER • ,LOW TURN OUT OF BROKERS ON A RAINY DAY SO LOW SALES

Thank you very much for your cooperation for the survey.
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Department of Environment, City Council of Nairobi
National Environment Management Authority

QUESTIONNAIRES TO MIDDLEMANS/BROKERS IN DANDORA DUMP SITE
(Survey Date: 6th-20th April 2010)

1.1 Name of Broker/Group/CBO	JOSEPH KIRAGU		
1.2 Name of Person Reply to the Questionnaires	JOSEPH KIRAGU	1.3 position	BUSINESSMAN
1.4 Location/Address of Business	DANDORA DUMP SITE		
1.5 Telephone Number	0732965339		
1.6 Registration (License) No.	1.7 Number of Employees/Staff	2	
1.8 How many waste pickers supply recyclables to you?	50		
1.9 Working Lot Area (m^2)	112 ACRES		
1.10 What are the major recyclable materials handled?			

1.11 Handling Quantity of Recyclables per Month and Average Unit Price of Recyclables

Name of Recyclables	Average Unit price of recyclables (Ksh/kg)		Handling Weight of Recyclables per Month (kg/Month)
	Buying Price	Selling Price	
Year 2010	Ksh.	Ksh.	
PET Bottles			
Other Plastics			
Carton			
Other Papers			
Bottles/Glass			
Tin & Cans			
Scrap Iron			
Aluminum Cans			
Aluminum			
Copper			
Others-1 （ ）			

1.12 Name of Brokers・Factory Handling your Recyclable Material
Name of Buying Broker : JOSEPH KIRAGU
Name of Selling Broker :
Name of Selling Factory :

1.13 Do you have an expansion plan of your business? Yes_____No_____ If "NO", Please state your reasons (i.e cost, incentive, marketing and others)

1.14 When did you start the activities?	
1.15 What was the main reason to start the activities?	
1.16 What are the issues to continue/sustain the activities?	

Thank you very much for your cooperation for the survey.
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QUESTIONNAIRES TO MIDDLEMANS/BROKERS IN DANDORA DUMP SITE
(Survey Date: 6th-20th April 2010)

1.1 Name of Broker/Group/CBO	JAMES NGUGI		
1.2 Name of Person Reply to the Questionnaires	JAMES NGUGI	1.3 position	BUSINESSMAN
1.4 Location/Address of Business	DANDORA DUMP SITE		
1.5 Telephone Number 0727617433			
1.6 Registration (License) No. NONE	1.7 Number of Employees/Staff	3	
1.8 How many waste pickers supply recyclables to you?	20		
1.9 Working Lot Area (m^2)	0.25 ACRE		
1.10 What are the major recyclable materials handled?	GLASS		

1.11 Handling Quantity of Recyclables per Month and Average Unit Price of Recyclables

Name of Recyclables	Average Unit price of recyclables (Ksh/kg)		Handling Weight of Recyclables per Month (kg/Month)
	Buying Price	Selling Price	
Year 2010	Ksh.	Ksh.	
PET Bottles			
Other Plastics			
Carton			
Other Papers			
Bottles/Glass	1	2	2,000
Tin & Cans			
Scrap Iron			
Aluminum Cans			
Aluminum			
Copper			
Others-1（ ）			

1.12 Name of Brokers・Factory Handling your Recyclable Material
Name of Buying Broker : JAMES NGUGI
Name of Selling Broker :
Name of Selling Factory : CENTRAL GLASS INDUSTRIES

1.13 Do you have an expansion plan of your business? Yes__X____No_____ If “NO”, Please state your reasons (i.e cost, incentive, marketing and others)

1.14 When did you start the activities?	2000
1.15 What was the main reason to start the activities?	AS A LIVELIHOOD
1.16 What are the issues to continue/sustain the activities?	• INVESTMENT CAPITAL • SALE PRICE

Thank you very much for your cooperation for the survey.
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Department of Environment, City Council of Nairobi
National Environment Management Authority

QUESTIONNAIRES TO MIDDLEMANS/BROKERS IN DANDORA DUMP SITE
(Survey Date: 6th-20th April 2010)

1.1 Name of Broker/Group/CBO	GERALD RANWAGA		
1.2 Name of Person Reply to the Questionnaires	GERALD RANWAGA	1.3 position	BUSINESSMAN
1.4 Location/Address of Business	DANDORA DUMP SITE		
1.5 Telephone Number	0723968136		
1.6 Registration (License) No.	1.7 Number of Employees/Staff	3	
1.8 How many waste pickers supply recyclables to you?	5		
1.9 Working Lot Area (m^2)	20 × 20		
1.10 What are the major recyclable materials handled?	ALUMINIUM FOIL,PLASTICS,TINS		

1.11 Handling Quantity of Recyclables per Month and Average Unit Price of Recyclables

Name of Recyclables	Average Unit price of recyclables (Ksh/kg)		Handling Weight of Recyclables per Month (kg/Month)
	Buying Price	Selling Price	
Year 2010	Ksh.	Ksh.	
PET Bottles			
Other Plastics	8	10	500
Carton			
Other Papers			
Bottles/Glass			
Tin & Cans			
Scrap Iron			
Aluminum Cans	30	35	4,000
Aluminum			
Copper			
Others-1（ ）			

1.12 Name of Brokers・Factory Handling your Recyclable Material
Name of Buying Broker : GERALD RANWAGA
Name of Selling Broker :
Name of Selling Factory : MUNGA SCRAP METAL

1.13 Do you have an expansion plan of your business? Yes__X____No_____ If “NO”, Please state your reasons (i.e cost, incentive, marketing and others)

1.14 When did you start the activities?	1999
1.15 What was the main reason to start the activities?	AS A LIVELIHOOD
1.16 What are the issues to continue/sustain the activities?	SALE PRICE

Thank you very much for your cooperation for the survey.
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National Environment Management Authority

QUESTIONNAIRES TO MIDDLEMANS/BROKERS IN DANDORA DUMP SITE
(Survey Date: 6th-20th April 2010)

1.1 Name of Broker/Group/CBO	PAUL THUMBI KABUTHI		
1.2 Name of Person Reply to the Questionnaires	PAUL THUMBI KABUTHI	1.3 position	
1.4 Location/Address of Business	DANDORA DUMP SITE		
1.5 Telephone Number	0727326188		
1.6 Registration (License) No.		1.7 Number of Employees/Staff	13
1.8 How many waste pickers supply recyclables to you?	50-70		
1.9 Working Lot Area (m^2)	100 × 100M		
1.10 What are the major recyclable materials handled?	PLASTICS		

1.11 Handling Quantity of Recyclables per Month and Average Unit Price of Recyclables

Name of Recyclables	Average Unit price of recyclables (Ksh/kg)		Handling Weight of Recyclables per Month (kg/Month)
	Buying Price	Selling Price	
Year 2010	KSH.	Ksh.	
PET Bottles			
Other Plastics	8	15	5,000
Carton			
Other Papers			
Bottles/Glass			
Tin & Cans			
Scrap Iron			
Aluminum Cans			
Aluminum			
Copper			
Others-1（ ）			

1.12 Name of Brokers・Factory Handling your Recyclable Material
Name of Buying Broker : PAUL THUMBI KARIUKI
Name of Selling Broker : WAWERU
Name of Selling Factory :

1.13 Do you have an expansion plan of your business? Yes__X____No_____ If “NO”, Please state your reasons (i.e cost, incentive, marketing and others)

1.14 When did you start the activities?	14-03-2006
1.15 What was the main reason to start the activities?	TO EARN A LIVING
1.16 What are the issues to continue/sustain the activities?	LACK OF RESOURCEFULL MATERIALS

Thank you very much for your cooperation for the survey.
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Department of Environment, City Council of Nairobi
National Environment Management Authority

QUESTIONNAIRES TO MIDDLEMANS/BROKERS IN DANDORA DUMP SITE
(Survey Date: 6th-20th April 2010)

1.1 Name of Broker/Group/CBO	PAUL MWAURA MWANGI		
1.2 Name of Person Reply to the Questionnaires	PAUL MWAURA MWANGI	1.3 position	BUSINESSMAN
1.4 Location/Address of Business	DANDORA DUMP SITE		
1.5 Telephone Number	0725262887		
1.6 Registration (License) No.		1.7 Number of Employees/Staff	3
1.8 How many waste pickers supply recyclables to you?	50		
1.9 Working Lot Area (m^2)	2 ACRES		
1.10 What are the major recyclable materials handled?	PET BOTTLES,PLASTICS,CARTON,PAPERS,GLASS,TINS & CANS, SCRAP IRON		

1.11 Handling Quantity of Recyclables per Month and Average Unit Price of Recyclables

Name of Recyclables	Average Unit price of recyclables (Ksh/kg)		Handling Weight of Recyclables per Month (kg/Month)
	Buying Price	Selling Price	
Year 2010	KSH.	Ksh.	
PET Bottles	5	7	7
Other Plastics	5	12	3
Carton	1	3	20
Other Papers	3	6	10
Bottles/Glass	1	2	7
Tin & Cans	10	18	1
Scrap Iron	12	20	0.5
Aluminum Cans			
Aluminum			
Copper			
Others-1（ ）			

1.12 Name of Brokers・Factory Handling your Recyclable Material
Name of Buying Broker : PAUL MWAURA MWANGI
Name of Selling Broker : SAKAYEMA, KAMANGO
Name of Selling Factory : CENTRAL GLASS,KIOI SCRAP METAL

1.13 Do you have an expansion plan of your business? Yes__X____No_____ If “NO”, Please state your reasons (i.e cost, incentive, marketing and others)

1.14 When did you start the activities?	2000
1.15 What was the main reason to start the activities?	EMPLOYMENT
1.16 What are the issues to continue/sustain the activities?	• PRESENCE OF A GOOD MARKET • AVAILABILITY OF RESOURCES

Thank you very much for your cooperation for the survey.
JICA Survey Team for Preparatory Survey for Integrated Solid Waste Management in Nairobi City
Department of Environment, City Council of Nairobi
National Environment Management Authority

QUESTIONNAIRES TO MIDDLEMANS/BROKERS IN DANDORA DUMP SITE
(Survey Date: 6th-20th April 2010)

1.1 Name of Broker/Group/CBO	JAMES NJOROGE KAIGAI		
1.2 Name of Person Reply to the Questionnaires	JAMES NJOROGE KAIGAI	1.3 position	BUSINESSMAN
1.4 Location/Address of Business	DANDORA DUMP SITE		
1.5 Telephone Number	0726206743		
1.6 Registration (License) No.		1.7 Number of Employees/Staff	3
1.8 How many waste pickers supply recyclables to you?	30		
1.9 Working Lot Area (m^2)	10,000		
1.10 What are the major recyclable materials handled?	PET BOTTLES,TINS & CANS,SRCAP IRON		

1.11 Handling Quantity of Recyclables per Month and Average Unit Price of Recyclables

Name of Recyclables	Average Unit price of recyclables (Ksh/kg)		Handling Weight of Recyclables per Month (kg/Month)
	Buying Price	Selling Price	
Year 2010	KSH.	Ksh.	
PET Bottles	3	10	
Other Plastics			
Carton			
Other Papers			
Bottles/Glass			
Tin & Cans	5	10	
Scrap Iron	10	15	
Aluminum Cans			
Aluminum			
Copper			
Others-1（ ）			

1.12 Name of Brokers・Factory Handling your Recyclable Material
Name of Buying Broker :
Name of Selling Broker :
Name of Selling Factory : KEN AFRIC

1.13 Do you have an expansion plan of your business? Yes__X____No_____ If “NO”, Please state your reasons (i.e cost, incentive, marketing and others)

1.14 When did you start the activities?	2009
1.15 What was the main reason to start the activities?	EMPLOYMENT
1.16 What are the issues to continue/sustain the activities?	• PRESENCE OF A GOOD MARKET • AVAILABILITY OF RESOURCES

Thank you very much for your cooperation for the survey.
JICA Survey Team for Preparatory Survey for Integrated Solid Waste Management in Nairobi City
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National Environment Management Authority

QUESTIONNAIRES TO MIDDLEMANS/BROKERS IN DANDORA DUMP SITE
(Survey Date: 6th-20th April 2010)

1.1 Name of Broker/Group/CBO	JANE WAMBUI		
1.2 Name of Person Reply to the Questionnaires	JANE WAMBUI	1.3 position	
1.4 Location/Address of Business	DANDORA DUMP SITE		
1.5 Telephone Number	0720214148		
1.6 Registration (License) No.		1.7 Number of Employees/Staff	
1.8 How many waste pickers supply recyclables to you?	50		
1.9 Working Lot Area (m^2)	50 × 100		
1.10 What are the major recyclable materials handled?	PET BOTTLES,PLASTICS,CARTON,PAPERS,GLASS,TINS & CANS		

1.11 Handling Quantity of Recyclables per Month and Average Unit Price of Recyclables

Name of Recyclables	Average Unit price of recyclables (Ksh/kg)		Handling Weight of Recyclables per Month (kg/Month)
	Buying Price	Selling Price	
Year 2010	KSH.	Ksh.	
PET Bottles	5	8	8
Other Plastics	10	13	4
Carton	2	4	10
Other Papers	3	6	4
Bottles/Glass	1	1	12
Tin & Cans	12	16	3
Scrap Iron			
Aluminum Cans			
Aluminum			
Copper			
Others-1（ ）			

1.12 Name of Brokers・Factory Handling your Recyclable Material
Name of Buying Broker :
Name of Selling Broker :
Name of Selling Factory : KAMANGO WASTE PAPERS,KIOI SCRAP METAL

1.13 Do you have an expansion plan of your business? Yes__X____No_____ If “NO”, Please state your reasons (i.e cost, incentive, marketing and others)

1.14 When did you start the activities?	1996
1.15 What was the main reason to start the activities?	SOURCE OF INCOME
1.16 What are the issues to continue/sustain the activities?	CARTELS IN THE MARKET

Thank you very much for your cooperation for the survey.
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QUESTIONNAIRES TO MIDDLEMANS/BROKERS IN DANDORA DUMP SITE
(Survey Date: 6th-20th April 2010)

1.1 Name of Broker/Group/CBO	JOSEPH MWAURA		
1.2 Name of Person Reply to the Questionnaires	JOSEPH MWAURA	1.3 position	
1.4 Location/Address of Business	DANDORA DUMP SITE		
1.5 Telephone Number	0728058000		
1.6 Registration (License) No.		1.7 Number of Employees/Staff	2
1.8 How many waste pickers supply recyclables to you?	20		
1.9 Working Lot Area (m^2)	100 × 100		
1.10 What are the major recyclable materials handled?	PET BOTTLES,PLASTICS,CARTON,GLASS,TINS & CANS		

1.11 Handling Quantity of Recyclables per Month and Average Unit Price of Recyclables

Name of Recyclables	Average Unit price of recyclables (Ksh/kg)		Handling Weight of Recyclables per Month (kg/Month)
	Buying Price	Selling Price	
Year 2010	KSH.	Ksh.	
PET Bottles	5	7	1.5
Other Plastics	10	13	1
Carton	2	3	5
Other Papers			
Bottles/Glass	1	2.50	3
Tin & Cans	10	15	1
Scrap Iron			
Aluminum Cans			
Aluminum			
Copper			
Others-1（ ）			

1.12 Name of Brokers・Factory Handling your Recyclable Material
Name of Buying Broker : JOSEPH MWAURA
Name of Selling Broker : SAKAYEMA,KAMANGO
Name of Selling Factory : CENTRAL GLASS

1.13 Do you have an expansion plan of your business? Yes__X____No_____ If “NO”, Please state your reasons (i.e cost, incentive, marketing and others)

1.14 When did you start the activities?	2008
1.15 What was the main reason to start the activities?	TO EARN A LIVING
1.16 What are the issues to continue/sustain the activities?	

Thank you very much for your cooperation for the survey.
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QUESTIONNAIRES TO MIDDLEMANS/BROKERS IN DANDORA DUMP SITE
(Survey Date: 6th-20th April 2010)

1.1 Name of Broker/Group/CBO	JOSEPH WAMAI		
1.2 Name of Person Reply to the Questionnaires	JOSEPH WAMAI	1.3 position	BUSINESSMAN
1.4 Location/Address of Business	DANDORA DUMP SITE		
1.5 Telephone Number	0727930969		
1.6 Registration (License) No.	1.7 Number of Employees/Staff	2	
1.8 How many waste pickers supply recyclables to you?	15		
1.9 Working Lot Area (m^2)	20 × 50 FT		
1.10 What are the major recyclable materials handled?	PET BOTTLESONION NETS		

1.11 Handling Quantity of Recyclables per Month and Average Unit Price of Recyclables

Name of Recyclables	Average Unit price of recyclables (Ksh/kg)		Handling Weight of Recyclables per Month (kg/Month)
	Buying Price	Selling Price	
Year 2010	KSH.	Ksh.	
PET Bottles	4	8	800
Other Plastics			
Carton			
Other Papers			
Bottles/Glass			
Tin & Cans			
Scrap Iron			
Aluminum Cans			
Aluminum			
Copper			
0nion nets	2	9	4000 nets
Others-1（ ）			

1.12 Name of Brokers・Factory Handling your Recyclable Material
Name of Buying Broker : JOSEPH WAMAI
Name of Selling Broker : WAKULIMA MARKET
Name of Selling Factory : CHINA COMPANY

1.13 Do you have an expansion plan of your business? Yes__X____No_____ If “NO”, Please state your reasons (i.e cost, incentive, marketing and others)

1.14 When did you start the activities?	2000
1.15 What was the main reason to start the activities?	SELF EMPLOYAMENT
1.16 What are the issues to continue/sustain the activities?	TOO MANY MIDDLEMEN IN THE BUSINESS.

Thank you very much for your cooperation for the survey.
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Department of Environment, City Council of Nairobi
National Environment Management Authority

QUESTIONNAIRES TO MIDDLEMANS/BROKERS IN DANDORA DUMP SITE
(Survey Date: 6th-20th April 2010)

1.1 Name of Broker/Group/CBO	PETER MUTHAMI		
1.2 Name of Person Reply to the Questionnaires	PETER MUTHAMI	1.3 position	BUSINESSMAN
1.4 Location/Address of Business	DANDORA DUMP SITE		
1.5 Telephone Number	0722824175		
1.6 Registration (License) No.		1.7 Number of Employees/Staff	1
1.8 How many waste pickers supply recyclables to you?			
1.9 Working Lot Area (m^2)	20 × 40 FT		
1.10 What are the major recyclable materials handled?	PET BOTTLES,PLASTICS,TINS & CANS		

1.11 Handling Quantity of Recyclables per Month and Average Unit Price of Recyclables

Name of Recyclables	Average Unit price of recyclables (Ksh/kg)		Handling Weight of Recyclables per Month (kg/Month)
	Buying Price	Selling Price	
Year 2010	KSH.	Ksh.	
PET Bottles	4	7	1
Other Plastics	10	13	1
Carton			
Other Papers			
Bottles/Glass			
Tin & Cans	15	20	800
Scrap Iron			
Aluminum Cans			
Aluminum			
Copper			
Others-1（ ）			

1.12 Name of Brokers・Factory Handling your Recyclable Material
Name of Buying Broker : PETER MUTHAMI
Name of Selling Broker : SAKAYEMA
Name of Selling Factory : KEN PLASTIC

1.13 Do you have an expansion plan of your business? Yes__X____No_____ If “NO”, Please state your reasons (i.e cost, incentive, marketing and others)

1.14 When did you start the activities?	2008
1.15 What was the main reason to start the activities?	AVAILABILITY OF RECYCLABLES
1.16 What are the issues to continue/sustain the activities?	PRESENCE OF BROKERS AT THE MARKET

Thank you very much for your cooperation for the survey.
JICA Survey Team for Preparatory Survey for Integrated Solid Waste Management in Nairobi City
Department of Environment, City Council of Nairobi
National Environment Management Authority

QUESTIONNAIRES TO MIDDLEMANS/BROKERS IN DANDORA DUMP SITE
(Survey Date: 6th-20th April 2010)

1.1 Name of Broker/Group/CBO	JOSEPH RAIMA		
1.2 Name of Person Reply to the Questionnaires	JOSEPH RAIMA	1.3 position	BUSINESSMAN
1.4 Location/Address of Business			
1.5 Telephone Number	0727502640		
1.6 Registration (License) No.	1.7 Number of Employees/Staff	3	
1.8 How many waste pickers supply recyclables to you?	40		
1.9 Working Lot Area (m^2)	30 × 50 FT		
1.10 What are the major recyclable materials handled?	SOLES & ONION NETS		

1.11 Handling Quantity of Recyclables per Month and Average Unit Price of Recyclables

Name of Recyclables	Average Unit price of recyclables (Ksh/kg)		Handling Weight of Recyclables per Month (kg/Month)
	Buying Price	Selling Price	
Year 2010	KSH.	Ksh.	
PET Bottles			
Other Plastics			
Carton			
Other Papers			
Bottles/Glass			
Tin & Cans			
Scrap Iron			
Aluminum Cans			
Aluminum			
Copper			
Soles	20	32	2tons
Others-1 （ ）	2	9	7,000 nets

1.12 Name of Brokers・Factory Handling your Recyclable Material
Name of Buying Broker : JOSEPH RAIMA
Name of Selling Broker : WAKULIMA MARKET
Name of Selling Factory : TOPEN

1.13 Do you have an expansion plan of your business? Yes__X____No_____ If “NO”, Please state your reasons (i.e cost, incentive, marketing and others)

1.14 When did you start the activities?	2004
1.15 What was the main reason to start the activities?	AVAILABILITY OF RECYCLABLES.
1.16 What are the issues to continue/sustain the activities?	

Thank you very much for your cooperation for the survey.
JICA Survey Team for Preparatory Survey for Integrated Solid Waste Management in Nairobi City
Department of Environment, City Council of Nairobi
National Environment Management Authority

QUESTIONNAIRES TO MIDDLEMANS/BROKERS IN DANDORA DUMP SITE
(Survey Date: 6th-20th April 2010)

1.1 Name of Broker/Group/CBO	MICHEAL KITEME		
1.2 Name of Person Reply to the Questionnaires	MICHEAL KITEME	1.3 position	BUSINESSMAN
1.4 Location/Address of Business	DANDORA DUMP SITE		
1.5 Telephone Number	0720923683		
1.6 Registration (License) No.	1.7 Number of Employees/Staff	5	
1.8 How many waste pickers supply recyclables to you?	20		
1.9 Working Lot Area (m^2)	100 × 100 FT		
1.10 What are the major recyclable materials handled?	PLASTICS,CARTON,PAPERS,GLASS		

1.11 Handling Quantity of Recyclables per Month and Average Unit Price of Recyclables

Name of Recyclables	Average Unit price of recyclables (Ksh/kg)		Handling Weight of Recyclables per Month (kg/Month)
	Buying Price	Selling Price	
Year 2010	KSH.	Ksh.	
PET Bottles			
Other Plastics	10	13	1,000
Carton	2	4	5,000
Other Papers	2	4	5,000
Bottles/Glass	10	15	500
Tin & Cans			
Scrap Iron			
Aluminum Cans			
Aluminum			
Copper			
Others-1（ ）			

1.12 Name of Brokers・Factory Handling your Recyclable Material
Name of Buying Broker : MICHEAL KITEME
Name of Selling Broker : KAMONGO
Name of Selling Factory :

1.13 Do you have an expansion plan of your business? Yes__X____No_____ If “NO”, Please state your reasons (i.e cost, incentive, marketing and others)

1.14 When did you start the activities?	2000
1.15 What was the main reason to start the activities?	TO EARN A LIVING
1.16 What are the issues to continue/sustain the activities?	READY MARKET

Thank you very much for your cooperation for the survey.
JICA Survey Team for Preparatory Survey for Integrated Solid Waste Management in Nairobi City
Department of Environment, City Council of Nairobi
National Environment Management Authority

QUESTIONNAIRES TO MIDDLEMANS/BROKERS IN DANDORA DUMP SITE
(Survey Date: 6th-20th April 2010)

1.1 Name of Broker/Group/CBO	STEPHEN IRUNGU		
1.2 Name of Person Reply to the Questionnaires	STEPHEN IRUNGU	1.3 position	BUSINESSMAN
1.4 Location/Address of Business	MUKURU RECYCLING CENTRE		
1.5 Telephone Number	'0727617433		
1.6 Registration (License) No.	1.7 Number of Employees/Staff	3	
1.8 How many waste pickers supply recyclables to you?	40		
1.9 Working Lot Area (m^2)	2,500		
1.10 What are the major recyclable materials handled?	PET BOTTLES,CARTON,PAPERS,GLASS,TINS & CANS,SCRAP IRON,ALUMINIU,COPPER		

1.11 Handling Quantity of Recyclables per Month and Average Unit Price of Recyclables

Name of Recyclables	Average Unit price of recyclables (Ksh/kg)		Handling Weight of Recyclables per Month (kg/Month)
	Buying Price	Selling Price	
Year 2010	KSH.	Ksh.	
PET Bottles	10	13	6,000
Other Plastics			
Carton	2	3.50	4,000
Other Papers	2	3.50	3,000
Bottles/Glass	1	2	10,000
Tin & Cans	10	15	5
Scrap Iron	10	15	12
Aluminum Cans			
Aluminum	60	70	5,000
Copper	70	85	100
Others-1（ ）			

1.12 Name of Brokers・Factory Handling your Recyclable Material
Name of Buying Broker : STEPHEN IRUNGU
Name of Selling Broker :
Name of Selling Factory : SUPAFOAM CO.,KAMONGO WASTE PAPERS,KEN PLASTICS PRIMIER

1.13 Do you have an expansion plan of your business? Yes__X____No_____ If "NO", Please state your reasons (i.e cost, incentive, marketing and others)

1.14 When did you start the activities?	1990
1.15 What was the main reason to start the activities?	SELF EMPLOYMENT
1.16 What are the issues to continue/sustain the activities?	• LACK OF MATERIALS • POOR MARKET

Thank you very much for your cooperation for the survey.
JICA Survey Team for Preparatory Survey for Integrated Solid Waste Management in Nairobi City
Department of Environment, City Council of Nairobi
National Environment Management Authority

QUESTIONNAIRES TO MIDDLEMANS/BROKERS IN DANDORA DUMP SITE
(Survey Date: 6th-20th April 2010)

1.1 Name of Broker/Group/CBO	JOSEPH SAFARI		
1.2 Name of Person Reply to the Questionnaires	JOSEPH SAFARI	1.3 position	BUSINESSMAN
1.4 Location/Address of Business	DANDORA DUMP SITE		
1.5 Telephone Number	'0720957905		
1.6 Registration (License) No.		1.7 Number of Employees/Staff	SOLE
1.8 How many waste pickers supply recyclables to you?	50		
1.9 Working Lot Area (m^2)	40 × 60 FT		
1.10 What are the major recyclable materials handled?	PET BOTTLES,PLASTICS,CARTON,PAPERS,GLASS,TINS & CANS,BONES		

1.11 Handling Quantity of Recyclables per Month and Average Unit Price of Recyclables

Name of Recyclables	Average Unit price of recyclables (Ksh/kg)		Handling Weight of Recyclables per Month (kg/Month)
	Buying Price	Selling Price	
Year 2010	KSH.	Ksh.	
PET Bottles	5	8	8,000
Other Plastics	10	13	4,000
Carton	2	4	10,000
Other Papers	3	6	4,000
Bottles/Glass	1	1.50	12,000
Tin & Cans	12	16	3,000
Scrap Iron			
Aluminum Cans			
Aluminum			
Copper			
Bones	2	5	5,000
Others-1（ ）			

1.12 Name of Brokers・Factory Handling your Recyclable Material
Name of Buying Broker : JOSEPH SAFARI
Name of Selling Broker :
Name of Selling Factory : KAMANGO WASTE PAPERS,KIOI METALLIC,CHINESE COMPANY,PLASTIC RECYCLERS

1.13 Do you have an expansion plan of your business? Yes__X____No_____ If "NO", Please state your reasons (i.e cost, incentive, marketing and others)

1.14 When did you start the activities?	1997
1.15 What was the main reason to start the activities?	SOURCE OF INCOME
1.16 What are the issues to continue/sustain the activities?	CARTELS IN THE MARKET

Thank you very much for your cooperation for the survey.
JICA Survey Team for Preparatory Survey for Integrated Solid Waste Management in Nairobi City
Department of Environment, City Council of Nairobi
National Environment Management Authority

QUESTIONNAIRES TO MIDDLEMANS/BROKERS IN DANDORA DUMP SITE
(Survey Date: 6th-20th April 2010)

1.1 Name of Broker/Group/CBO	JULIA WAIRIMU GUCHU		
1.2 Name of Person Reply to the Questionnaires	JULIA WAIRIMU GUCHU	1.3 position	BUSINESSWOMAN
1.4 Location/Address of Business	DANDORA DUMP SITE		
1.5 Telephone Number	0711830527		
1.6 Registration (License) No.	1.7 Number of Employees/Staff	SOLE	
1.8 How many waste pickers supply recyclables to you?	50		
1.9 Working Lot Area (m^2)	60 × 100 FT		
1.10 What are the major recyclable materials handled?	PLASTICS,PAPERS,GLASS		

1.11 Handling Quantity of Recyclables per Month and Average Unit Price of Recyclables

Name of Recyclables	Average Unit price of recyclables (Ksh/kg)		Handling Weight of Recyclables per Month (kg/Month)
	Buying Price	Selling Price	
Year 2010	KSH.	Ksh.	
PET Bottles			
Other Plastics	10	14	4,000
Carton			
Other Papers	7	10	10,000
Bottles/Glass	1	3	1,000
Tin & Cans			
Scrap Iron			
Aluminum Cans			
Aluminum			
Copper			
Others-1（ ）			

1.12 Name of Brokers・Factory Handling your Recyclable Material
Name of Buying Broker : JULIA WAIRIMU GUCHU
Name of Selling Broker : SAKAYEMA
Name of Selling Factory : PANAFRIC

1.13 Do you have an expansion plan of your business? Yes__X____No_____ If “NO”, Please state your reasons (i.e cost, incentive, marketing and others)

1.14 When did you start the activities?	2005
1.15 What was the main reason to start the activities?	EARN A LIVING
1.16 What are the issues to continue/sustain the activities?	

Thank you very much for your cooperation for the survey.
JICA Survey Team for Preparatory Survey for Integrated Solid Waste Management in Nairobi City
Department of Environment, City Council of Nairobi
National Environment Management Authority

QUESTIONNAIRES TO MIDDLEMANS/BROKERS IN DANDORA DUMP SITE
(Survey Date: 6th-20th April 2010)

1.1 Name of Broker/Group/CBO	JULIA WAIRIMU GUCHU		
1.2 Name of Person Reply to the Questionnaires	JULIA WAIRIMU GUCHU	1.3 position	BUSINESSWOMAN
1.4 Location/Address of Business	DANDORA DUMP SITE		
1.5 Telephone Number	0711830527		
1.6 Registration (License) No.	1.7 Number of Employees/Staff	SOLE	
1.8 How many waste pickers supply recyclables to you?	50		
1.9 Working Lot Area (m^2)	60 × 100 FT		
1.10 What are the major recyclable materials handled?	PLASTICS,PAPERS,GLASS		

1.11 Handling Quantity of Recyclables per Month and Average Unit Price of Recyclables

Name of Recyclables	Average Unit price of recyclables (Ksh/kg)		Handling Weight of Recyclables per Month (kg/Month)
	Buying Price	Selling Price	
Year 2010	KSH.	Ksh.	
PET Bottles			
Other Plastics	10	14	4,000
Carton			
Other Papers	7	10	10,000
Bottles/Glass	1	3	1,000
Tin & Cans			
Scrap Iron			
Aluminum Cans			
Aluminum			
Copper			
Others-1（ ）			

1.12 Name of Brokers・Factory Handling your Recyclable Material
Name of Buying Broker : JULIA WAIRIMU GUCHU
Name of Selling Broker : SAKAYEMA
Name of Selling Factory : PANAFRIC

1.13 Do you have an expansion plan of your business? Yes__X____No_____ If “NO”, Please state your reasons (i.e cost, incentive, marketing and others)

1.14 When did you start the activities?	2005
1.15 What was the main reason to start the activities?	EARN A LIVING
1.16 What are the issues to continue/sustain the activities?	

Thank you very much for your cooperation for the survey.
JICA Survey Team for Preparatory Survey for Integrated Solid Waste Management in Nairobi City
Department of Environment, City Council of Nairobi
National Environment Management Authority

2. Questionnaires to Middlemen/Brokers of Junk Dealers in Divisions

QUESTIONNAIRES TO MIDDLEMANS/BROKERS OF JUNK DEALERS IN DIVISIONS
(Division Name KASARANI Survey Date: 21ST APRIL 2010)

1.1 Name of Junkshop/Broker/Group/CBO		DUNSEL SCRAP DEALERS		
1.2 Name of Person Reply to the Questionnaires		JACKLINE OYUGI	1.3 position	STAFF
1.4 Location/Address of Business		KARIOBANGI NORTH WARD;LIGHT INDUSTRIES		
1.5 Telephone Number		0725978411		
1.6 Registration (License) No.	117822/2	1.7 Number of Employees/Staff	4	
1.8 How many waste pickers supply recyclables to you?				
1.9 Working Lot Area (m^2)		3200		
1.10 What are the major recyclable materials handled?		TINS & CANS,SCRAP IRON,ALUMINIUM,BRASS		

1.11 Handling Quantity of Recyclables per Month and Average Unit Price of Recyclables

Name of Recyclables	Average Unit price of recyclables (Ksh/kg)		Handling Weight of Recyclables per Month (kg/Month)
	Buying Price	Selling Price	
PET Bottles			
Other Plastics			
Carton			
Other Papers			
Bottles/Glass			
Tin & Cans	17		2,000
Scrap Iron	20	24.50	50,000
Aluminum Cans			
Aluminum	95	100	
Copper			
Brass	50	55	1,000
Others-1 （ ）			

1.12 Name of Brokers・Factory Handling your Recyclable Material
Name of Buying Broker :Dunsel Scrap Dealers
Name of Selling Broker :
Name of Selling Factories : Munts Scrap Dealers

1.13 Do you have an expansion plan of your business? Yes___×___No_____ If "NO", Please state your reasons (i.e cost, incentive, marketing and others)

1.14 When did you start the activities?	2009
1.15 What was the main reason to start the activities?	Create Employment,Gain Interest
1.16 What are the issues to continue/sustain the activities?	Highly priced recyclables.

Thank you very much for your cooperation for the survey.
JICA Survey Team for Preparatory Survey for Integrated Solid Waste Management in Nairobi City
Department of Environment, City Council of Nairobi
National Environment Management Authority

QUESTIONNAIRES TO MIDDLEMANS/BROKERS OF JUNK DEALERS IN DIVISIONS
(Division Name KASARANI Survey Date: 21ST APRIL 2010)

1.1 Name of Junkshop/Broker/Group/CBO	JEMMART UNEEK INVESTMENTS		
1.2 Name of Person Reply to the Questionnaires	JOSEPH GITAU	1.3 position	MIDDLEMAN
1.4 Location/Address of Business	KARIOBANGI NORTH WARD;LIGHT INDUSTRIES		
1.5 Telephone Number	0712450437		
1.6 Registration (License) No.		1.7 Number of Employees/Staff	10
1.8 How many waste pickers supply recyclables to you?			
1.9 Working Lot Area (m^2)	2400		
1.10 What are the major recyclable materials handled?	PET BOTTLES,GLASS		

1.11 Handling Quantity of Recyclables per Month and Average Unit Price of Recyclables

Name of Recyclables	Average Unit price of recyclables (Ksh/kg)		Handling Weight of Recyclables per Month (kg/Month)
	Buying Price	Selling Price	
PET Bottles	14	17	16,000
Other Plastics			
Carton			
Other Papers			
Bottles/Glass	1	2	50,000
Tin & Cans			
Scrap Iron			
Aluminum Cans			
Aluminum			
Copper			
Others-1（ ）			

1.12 Name of Brokers・Factory Handling your Recyclable Material
Name of Buying Broker :JEMMART UNEEK INVESTMENTS
Name of Selling Broker :
Name of Selling Factories : CENTRAL GLASS,GREEN PLASTE

1.13 Do you have an expansion plan of your business? Yes__×____No_____ If “NO”, Please state your reasons (i.e cost, incentive, marketing and others)

1.14 When did you start the activities?	2003
1.15 What was the main reason to start the activities?	SOURCE OF INCOME & EMPLOYMENT
1.16 What are the issues to continue/sustain the activities?	CREATING EMPLOYMENT

Thank you very much for your cooperation for the survey.
JICA Survey Team for Preparatory Survey for Integrated Solid Waste Management in Nairobi City
Department of Environment, City Council of Nairobi
National Environment Management Authority

QUESTIONNAIRES TO MIDDLEMANS/BROKERS OF JUNK DEALERS IN DIVISIONS

(Division Name KASARANI Survey Date: 21ST APRIL 2010)

1.1 Name of Junkshop/Broker/Group/CBO	JUNKSI		
1.2 Name of Person Reply to the Questionnaires	EVANS KINUTHIA	1.3 position	MIDDLEMAN
1.4 Location/Address of Business	KARIOBANGI NORTH WARD;LIGHT INDUSTRIES		
1.5 Telephone Number	0721837806		
1.6 Registration (License) No.		1.7 Number of Employees/Staff	6
1.8 How many waste pickers supply recyclables to you?			
1.9 Working Lot Area (m^2)	2400		
1.10 What are the major recyclable materials handled?	PLASTICS		

1.11 Handling Quantity of Recyclables per Month and Average Unit Price of Recyclables

Name of Recyclables	Average Unit price of recyclables (Ksh/kg)		Handling Weight of Recyclables per Month (kg/Month)
	Buying Price	Selling Price	
PET Bottles			
Other Plastics	11	21	15,000
Carton			
Other Papers			
Bottles/Glass			
Tin & Cans			
Scrap Iron			
Aluminum Cans			
Aluminum			
Copper			
Others-1 （ ）			

1.12 Name of Brokers・Factory Handling your Recyclable Material

Name of Buying Broker :

Name of Selling Broker :

Name of Selling Factories : SKY PLUS;PREMIER/HALAL INDUSTRIES

1.13 Do you have an expansion plan of your business? Yes___×___No_____ If “NO”, Please state your reasons (i.e cost, incentive, marketing and others)

1.14 When did you start the activities?	2009
1.15 What was the main reason to start the activities?	CREATE EMPLOYMENT,EARN INTEREST,KEEP THE CITY CLEAN.
1.16 What are the issues to continue/sustain the activities?	WASTE REDUCTION

Thank you very much for your cooperation for the survey.
JICA Survey Team for Preparatory Survey for Integrated Solid Waste Management in Nairobi City
Department of Environment, City Council of Nairobi
National Environment Management Authority

QUESTIONNAIRES TO MIDDLEMANS/BROKERS OF JUNK DEALERS IN DIVISIONS
(Division Name KASARANI Survey Date: 19TH APRIL 2010)

1.1 Name of Junkshop/Broker/Group/CBO		JUSLLINE SCRAP DEALER § HARDWARES		
1.2 Name of Person Reply to the Questionnaires		JOSEPH K. KAGWAMBA	1.3 position	PARTNERSHIP
1.4 Location/Address of Business		KASARANI;KARIOBANGI NORTH WARD		
1.5 Telephone Number		0726031845		
1.6 Registration (License) No.	SM 553	1.7 Number of Employees/Staff	13	
1.8 How many waste pickers supply recyclables to you?				
1.9 Working Lot Area (m^2)		3200		
1.10 What are the major recyclable materials handled?		TINS § CANS,SCRAP IRON,ALUMINIUM CANS,ALUMINIUM		

1.11 Handling Quantity of Recyclables per Month and Average Unit Price of Recyclables

Name of Recyclables	Average Unit price of recyclables (Ksh/kg)		Handling Weight of Recyclables per Month (kg/Month)
	Buying Price	Selling Price	
PET Bottles			
Other Plastics			
Carton			
Other Papers			
Bottles/Glass			
Tin & Cans	10	12	4.166
Scrap Iron	10	12	40
Aluminum Cans	105	105	4.066
Aluminum			
Copper			
Others-1（ ）			

1.12 Name of Brokers・Factory Handling your Recyclable Material
Name of Buying Broker :
Name of Selling Broker :
Name of Selling Factories :

1.13 Do you have an expansion plan of your business? Yes__X____No_____ If “NO”, Please state your reasons (i.e cost, incentive, marketing and others)

1.14 When did you start the activities?	1985
1.15 What was the main reason to start the activities?	JOB CREATION
1.16 What are the issues to continue/sustain the activities?	CREATING JOBS

Thank you very much for your cooperation for the survey.
JICA Survey Team for Preparatory Survey for Integrated Solid Waste Management in Nairobi City
Department of Environment, City Council of Nairobi
National Environment Management Authority

QUESTIONNAIRES TO MIDDLEMANS/BROKERS OF JUNK DEALERS IN DIVISIONS

(Division Name KASARANI Survey Date: 19TH APRIL 2010)

1.1 Name of Junkshop/Broker/Group/CBO	UNCLE CROOGE		
1.2 Name of Person Reply to the Questionnaires	AGNESS OMWENGE	1.3 position	MIDDLEMAN
1.4 Location/Address of Business	MATHARE 4A WARD		
1.5 Telephone Number	0716266756		
1.6 Registration (License) No. NONE	1.7 Number of Employees/Staff	2	
1.8 How many waste pickers supply recyclables to you?	1		
1.9 Working Lot Area (m^2)	600		
1.10 What are the major recyclable materials handled?	PET BOTTLES,PLASTICS,CARTON,PAPERS,GLASS,TINS§CANS,		

1.11 Handling Quantity of Recyclables per Month and Average Unit Price of Recyclables

Name of Recyclables	Average Unit price of recyclables (Ksh/kg)		Handling Weight of Recyclables per Month (kg/Month)
	Buying Price	Selling Price	
PET Bottles	0	6	30
Other Plastics	0	7	70
Carton	0	3	100
Other Papers	0	9	200
Bottles/Glass	1 per bottle	5	400
Tin & Cans	1 each	12	0
Scrap Iron			
Aluminum Cans			
Aluminum			
Copper			
Others-1（ ）			

1.12 Name of Brokers・Factory Handling your Recyclable Material

Name of Buying Broker : AGNESS OMWENGE

Name of Selling Broker :

Name of Selling Factories :

1.13 Do you have an expansion plan of your business? Yes___X___No_____ If “NO”, Please state your reasons (i.e cost, incentive, marketing and others)

1.14 When did you start the activities?	JULY 2009
1.15 What was the main reason to start the activities?	NO OTHER JOB
1.16 What are the issues to continue/sustain the activities?	CREATE EMPLOYMENT

Thank you very much for your cooperation for the survey.

JICA Survey Team for Preparatory Survey for Integrated Solid Waste Management in Nairobi City
Department of Environment, City Council of Nairobi
National Environment Management Authority

QUESTIONNAIRES TO MIDDLEMANS/BROKERS OF JUNK DEALERS IN DIVISIONS

(Division Name LANGATA Survey Date: APRIL 2010)

1.1 Name of Junkshop/Broker/Group/CBO	MUGAA		
1.2 Name of Person Reply to the Questionnaires	WANJA	1.3 position	
1.4 Location/Address of Business	LANGATA		
1.5 Telephone Number			
1.6 Registration (License) No.		1.7 Number of Employees/Staff	7
1.8 How many waste pickers supply recyclables to you?	10		
1.9 Working Lot Area (m^2)	0.25 HA		
1.10 What are the major recyclable materials handled?	PET BOTTLES,PLASTICS,CARTON,PAPERS,GLASS,TINS& CANS,SCRAP IRON,ALUMINIUM CANS,ALUMINIUM,COPPER,BRASS,NYLON		

1.11 Handling Quantity of Recyclables per Month and Average Unit Price of Recyclables

Name of Recyclables	Average Unit price of recyclables (Ksh/kg)		Handling Weight of Recyclables per Month (kg/Month)
	Buying Price	Selling Price	
PET Bottles	10	12	2000
Other Plastics	5	8	2000
Carton	1	3	4000
Other Papers	3	6	2000
Bottles/Glass	5	8	1500
Tin & Cans	15	20	3000
Scrap Iron	15	20	4000
Aluminum Cans	70	80	100
Aluminum	70	80	100
Copper	250	300	50
Brass	150	200	50
Nylon	10	13	50
Others-1（ ）			

1.12 Name of Brokers・Factory Handling your Recyclable Material

Name of Buying Broker :WANJA

Name of Selling Broker :KAIGUA

Name of Selling Factories : CHINA COMPANY

1.13 Do you have an expansion plan of your business? Yes____×__No_____ If “NO”, Please state your reasons (i.e cost, incentive, marketing and others)

1.14 When did you start the activities?	1988
1.15 What was the main reason to start the activities?	MEANS OF LIVELIHOOD
1.16 What are the issues to continue/sustain the activities?	

Thank you very much for your cooperation for the survey.

JICA Survey Team for Preparatory Survey for Integrated Solid Waste Management in Nairobi City

Department of Environment, City Council of Nairobi

National Environment Management Authority

QUESTIONNAIRES TO MIDDLEMANS/BROKERS OF JUNK DEALERS IN DIVISIONS

(Division Name EMBAKASI Survey Date: APRIL 2010)

1.1 Name of Junkshop/Broker/Group/CBO	NONE		
1.2 Name of Person Reply to the Questionnaires	GEORGE NDUNG'U	1.3 position	OWNER
1.4 Location/Address of Business	DANDORA PHASE 1 ;DUNIA		
1.5 Telephone Number	0714598499		
1.6 Registration (License) No. NONE	1.7 Number of Employees/Staff	4	
1.8 How many waste pickers supply recyclables to you?	30		
1.9 Working Lot Area (m^2)	10 × 10 FEET		
1.10 What are the major recyclable materials handled?	PET BOTTLES,PLASTICS,CARTON		

1.11 Handling Quantity of Recyclables per Month and Average Unit Price of Recyclables

Name of Recyclables	Average Unit price of recyclables (Ksh/kg)		Handling Weight of Recyclables per Month (kg/Month)
	Buying Price	Selling Price	
PET Bottles	5.50	7.50	2,000
Other Plastics	10	14	300
Carton	1.50	3.50	3,000
Other Papers			
Bottles/Glass			
Tin & Cans	10	17	200
Scrap Iron	15	20	500
Aluminum Cans	50	80	50
Aluminum			
Copper	200	300	30
Others-1 （ ）			

1.12 Name of Brokers・Factory Handling your Recyclable Material

Name of Buying Broker :GEORGE NDUNG'U

Name of Selling Broker :

Name of Selling Factories : PRIMIER,KENPLAST

1.13 Do you have an expansion plan of your business? Yes___X__No_____ If "NO", Please state your reasons (i.e cost, incentive, marketing and others)

1.14 When did you start the activities?	2005
1.15 What was the main reason to start the activities?	SELF EMPLOYMENT
1.16 What are the issues to continue/sustain the activities?	• AVAILABILITY OF MARKET • AVAILABILITY OF RAW MATERIALS

Thank you very much for your cooperation for the survey.

JICA Survey Team for Preparatory Survey for Integrated Solid Waste Management in Nairobi City
Department of Environment, City Council of Nairobi
National Environment Management Authority

QUESTIONNAIRES TO MIDDLEMANS/BROKERS OF JUNK DEALERS IN DIVISIONS
(Division Name EMBAKASI Survey Date: APRIL 2010)

1.1 Name of Junkshop/Broker/Group/CBO	MUKURU BROTHERS		
1.2 Name of Person Reply to the Questionnaires	GEORGE KARIUKI	1.3 position	MEMBERS
1.4 Location/Address of Business	DANDORA DUMPSITE		
1.5 Telephone Number	0720663367		
1.6 Registration (License) No. NONE	1.7 Number of Employees/Staff	25	
1.8 How many waste pickers supply recyclables to you?	40		
1.9 Working Lot Area (m^2)	2500		
1.10 What are the major recyclable materials handled?	PET BOTTLES,PLASTICS,TINS § CANS,SCRAP IRON		

1.11 Handling Quantity of Recyclables per Month and Average Unit Price of Recyclables

Name of Recyclables	Average Unit price of recyclables (Ksh/kg)		Handling Weight of Recyclables per Month (kg/Month)
	Buying Price	Selling Price	
PET Bottles	0.50	1.50	2000 BOTTLES
Other Plastics	10	14	1500
Carton			
Other Papers	2	5	2,000
Bottles/Glass			
Tin & Cans	12	15	1,000
Scrap Iron	12	15	1,000
Aluminum Cans			
Aluminum			
Copper			
Others-1（ ）			

1.12 Name of Brokers・Factory Handling your Recyclable Material
Name of Buying Broker :MUKURU BROTHERS
Name of Selling Broker :
Name of Selling Factories : SAKAYEMA PLASTICS,KENPLAST

1.13 Do you have an expansion plan of your business? Yes___X___No_____ If “NO”, Please state your reasons (i.e cost, incentive, marketing and others)

1.14 When did you start the activities?	2002
1.15 What was the main reason to start the activities?	SELF EMPLOYMENET
1.16 What are the issues to continue/sustain the activities?	AVAILABILITY OF MARKET

Thank you very much for your cooperation for the survey.

JICA Survey Team for Preparatory Survey for Integrated Solid Waste Management in Nairobi City
Department of Environment, City Council of Nairobi
National Environment Management Authority

QUESTIONNAIRES TO MIDDLEMANS/BROKERS OF JUNK DEALERS IN DIVISIONS

(Division Name EMBAKASI Survey Date: APRIL 2010)

1.1 Name of Junkshop/Broker/Group/CBO	SELF		
1.2 Name of Person Reply to the Questionnaires	CHRISTINE MUTONO	1.3 position	
1.4 Location/Address of Business	TENA		
1.5 Telephone Number	0723249421		
1.6 Registration (License) No.		1.7 Number of Employees/Staff	4
1.8 How many waste pickers supply recyclables to you?	10		
1.9 Working Lot Area (m^2)	80		
1.10 What are the major recyclable materials handled?	PET BOTTLES,PLASTICS,GLASS,TINS & CANS,SCRAP IRON,ALUMINIUM CANS,ALUMINIUM,COPPER		

1.11 Handling Quantity of Recyclables per Month and Average Unit Price of Recyclables

Name of Recyclables	Average Unit price of recyclables (Ksh/kg)		Handling Weight of Recyclables per Month (kg/Month)
	Buying Price	Selling Price	
PET Bottles	1	2	2,500
Other Plastics	10	12	2,800
Carton			
Other Papers			
Bottles/Glass	1	2	2,000 PIECES
Tin & Cans	15	21	3,000
Scrap Iron			
Aluminum Cans	60	100	100
Aluminum			
Copper	200	330	30
Others-1 （ ）			

1.12 Name of Brokers・Factory Handling your Recyclable Material

Name of Buying Broker :

Name of Selling Broker :KIOI BROKERS,GICHOHI BROKEKRS

Name of Selling Factories : CHUI SCRAP METAL

1.13 Do you have an expansion plan of your business? Yes_ X___No_____ If “NO”, Please state your reasons (i.e cost, incentive, marketing and others)

1.14 When did you start the activities?	2001
1.15 What was the main reason to start the activities?	SOURCE OF INCOME
1.16 What are the issues to continue/sustain the activities?	INCOME

Thank you very much for your cooperation for the survey.

JICA Survey Team for Preparatory Survey for Integrated Solid Waste Management in Nairobi City
Department of Environment, City Council of Nairobi
National Environment Management Authority

QUESTIONNAIRES TO MIDDLEMANS/BROKERS OF JUNK DEALERS IN DIVISIONS
(Division Name EMBAKASI Survey Date: APRIL 2010)

1.1 Name of Junkshop/Broker/Group/CBO			
1.2 Name of Person Reply to the Questionnaires	ERIC MUTHEE	1.3 position	
1.4 Location/Address of Business	INNERCORE;UMOJA		
1.5 Telephone Number	0723555158		
1.6 Registration (License) NONE	1.7 Number of Employees/Staff	5	
1.8 How many waste pickers supply	30		
1.9 Working Lot Area (m^2)	100		
1.10 What are the major recyclable materials handled?	PET BTTLES, PLASTICS, CARTON, PAPERS ,GLASS, TINS&CANS, ALUMINIUM CANS, SHOE SOLES		

1.11 Handling Quantity of Recyclables per Month and Average Unit Price of Recyclables

Name of Recyclables	Average Unit price of recyclables (Ksh/kg)		Handling Weight of Recyclables per Month (kg/Month)
	Buying Price	Selling Price	
PET Bottles	1	2	3,000
Other Plastics	10	14	1200
Carton	3	5	2,000
Other Papers	3	5	2,000
Bottles/Glass	2	4	3,000
Tin & Cans	15	20	4,000
Scrap Iron			
Aluminum Cans	80	100	200
Aluminum			
Copper			
Shoe soles	10	15	600
Others-1（ ）			

1.12 Name of Brokers・Factory Handling your Recyclable Material
Name of Buying Broker :ERIC MUTHEE
Name of Selling Broker :KIOI BROKERS
Name of Selling Factories : PRIMIER COMPANY & KAMONGO

1.13 Do you have an expansion plan of your business? Yes___X___No_____ If “NO”, Please state your reasons (i.e cost, incentive, marketing and others)

1.14 When did you start the activities?	2000
1.15 What was the main reason to start the activities?	SOURCE OF INCOME
1.16 What are the issues to continue/sustain the activities?	CAPITAL

Thank you very much for your cooperation for the survey.
JICA Survey Team for Preparatory Survey for Integrated Solid Waste Management in Nairobi City
Department of Environment, City Council of Nairobi
National Environment Management Authority

QUESTIONNAIRES TO MIDDLEMANS/BROKERS OF JUNK DEALERS IN DIVISIONS
(Division Name EMBAKASI Survey Date: APRIL 2010)

1.1 Name of Junkshop/Broker/Group/CBO	SELF		
1.2 Name of Person Reply to the Questionnaires	ANTONY MAINA	1.3 position	
1.4 Location/Address of Business	EMBAKASI;UMOJA;INNERCORE		
1.5 Telephone Number	0727327799		
1.6 Registration (License) No.		1.7 Number of Employees/Staff	8
1.8 How many waste pickers supply recyclables to you?	20		
1.9 Working Lot Area (m^2)	150		
1.10 What are the major recyclable materials handled?	PET BOTTLES,PLASTICS,CARTON,GLASS,TINS&CANS,SCRAP IRON,ALUMINIUM CANS,COPPER		

1.11 Handling Quantity of Recyclables per Month and Average Unit Price of Recyclables

Name of Recyclables	Average Unit price of recyclables (Ksh/kg)		Handling Weight of Recyclables per Month (kg/Month)
	Buying Price	Selling Price	
PET Bottles	1	2	1,000
Other Plastics	10	15	3,000
Carton	2	4	10
Other Papers			
Bottles/Glass	1	3	0.5
Tin & Cans	15	13	5,000
Scrap Iron	15	20	
Aluminum Cans	60	80	200
Aluminum			
Copper	200	300	200
Others-1 （ ）			

1.12 Name of Brokers・Factory Handling your Recyclable Material
Name of Buying Broker :
Name of Selling Broker :
Name of Selling Factories :

1.13 Do you have an expansion plan of your business? Yes___X__No_____ If “NO”, Please state your reasons (i.e cost, incentive, marketing and others)

1.14 When did you start the activities?	1995
1.15 What was the main reason to start the activities?	SOURCE OF REVENUE
1.16 What are the issues to continue/sustain the activities?	INCOME

Thank you very much for your cooperation for the survey.

JICA Survey Team for Preparatory Survey for Integrated Solid Waste Management in Nairobi City
Department of Environment, City Council of Nairobi
National Environment Management Authority

QUESTIONNAIRES TO MIDDLEMANS/BROKERS OF JUNK DEALERS IN DIVISIONS
(Division Name EMBAKASI Survey Date: APRIL 2010)

1.1 Name of Junkshop/Broker/Group/CBO			
1.2 Name of Person Reply to the Questionnaires	STEPHEN MWANGI	1.3 position	
1.4 Location/Address of Business	EMBAKASI;TENA;UMOJA		
1.5 Telephone Number	0724437131		
1.6 Registration (License) No. NONE	1.7 Number of Employees/Staff	5	
1.8 How many waste pickers supply recyclables to	30		
1.9 Working Lot Area (m^2)	100		
1.10 What are the major recyclable materials handled?	PET BOTTLES,PLASTICS,CARTON,PAPERS,GLASS,TINS&CANS,SCRAP IRON,SHOE SOLES		

1.11 Handling Quantity of Recyclables per Month and Average Unit Price of Recyclables

Name of Recyclables	Average Unit price of recyclables (Ksh/kg)		Handling Weight of Recyclables per Month (kg/Month)
	Buying Price	Selling Price	
PET Bottles	1	2	1,500
Other Plastics	8	12	3,000
Carton	2	4	10,000
Other Papers	3	6	2,000
Bottles/Glass	1	3	3,000
Tin & Cans	15	21	5,000
Scrap Iron			
Aluminum Cans			
Aluminum			
Copper			
Shoe soles	15	20	200
Others-1( )			

1.12 Name of Brokers・Factory Handling your Recyclable Material
Name of Buying Broker :
Name of Selling Broker :
Name of Selling Factories : PRIMIER COMPANY,KAMONGO COMPANY

1.13 Do you have an expansion plan of your business? Yes___X___No_____ If "NO", Please state your reasons (i.e cost, incentive, marketing and others)

1.14 When did you start the activities?	2000
1.15 What was the main reason to start the activities?	SOURCE OF INCOME
1.16 What are the issues to continue/sustain the activities?	CAPITAL

Thank you very much for your cooperation for the survey.
JICA Survey Team for Preparatory Survey for Integrated Solid Waste Management in Nairobi City
Department of Environment, City Council of Nairobi
National Environment Management Authority

QUESTIONNAIRES TO MIDDLEMANS/BROKERS OF JUNK DEALERS IN DIVISIONS
(Division Name EMBAKASI Survey Date: APRIL 2010)

1.1 Name of Junkshop/Broker/Group/CBO			
1.2 Name of Person Reply to the Questionnaires	WILSON KAGUE	1.3 position	
1.4 Location/Address of Business	EMBAKASI;TENA;UMOJA		
1.5 Telephone Number	0720751779		
1.6 Registration (License) No. NONE	1.7 Number of Employees/Staff	3	
1.8 How many waste pickers supply recyclables to you?	15		
1.9 Working Lot Area (m^2)	50		
1.10 What are the major recyclable materials handled?	PET BOTTLES,PLASTICS,CARTON,TINS&CANS,SCRAP IRON,ALUMINIUM,SHOE SOLES		

1.11 Handling Quantity of Recyclables per Month and Average Unit Price of Recyclables

Name of Recyclables	Average Unit price of recyclables (Ksh/kg)		Handling Weight of Recyclables per Month (kg/Month)
	Buying Price	Selling Price	
PET Bottles	1	2	1,000 BOTTLES
Other Plastics	10	12	2,000
Carton	2	2	200
Other Papers			
Bottles/Glass			
Tin & Cans	15	20	2,500
Scrap Iron			
Aluminum Cans			
Aluminum	50	90	50
Copper			
Shoe Soles	2 EACH	17	300
Others-1（ ）			

1.12 Name of Brokers・Factory Handling your Recyclable Material
Name of Buying Broker :WILSON KAGUE
Name of Selling Broker :KIOI BROKER
Name of Selling Factories : PREMIER COMPANY

1.13 Do you have an expansion plan of your business? Yes___X___No_____ If “NO”, Please state your reasons (i.e cost, incentive, marketing and others)

1.14 When did you start the activities?	1995
1.15 What was the main reason to start the activities?	SOURCE OF INCOME
1.16 What are the issues to continue/sustain the activities?	CAPITAL

Thank you very much for your cooperation for the survey.

JICA Survey Team for Preparatory Survey for Integrated Solid Waste Management in Nairobi City
Department of Environment, City Council of Nairobi
National Environment Management Authority

QUESTIONNAIRES TO MIDDLEMANS/BROKERS OF JUNK DEALERS IN DIVISIONS
(Division Name KAMUKUNJI Survey Date: 19TH APRIL 2010)

1.1 Name of Junkshop/Broker/Group/CBO	JOSPHAT WASTE PAPERS		
1.2 Name of Person Reply to the Questionnaires	JOSPHAT NDUNGU	1.3 position	DIRECTOR
1.4 Location/Address of Business	UHURU WARD;AJUOGA ROAD		
1.5 Telephone Number	0722323195		
1.6 Registration (License) No. 1173537	1.7 Number of Employees/Staff	8	
1.8 How many waste pickers supply recyclables to you?	7		
1.9 Working Lot Area (m^2)	425		
1.10 What are the major recyclable materials handled?	PET BOTTLES,PLASTICS,CARTON,PAPERS,CLOTHING		

1.11 Handling Quantity of Recyclables per Month and Average Unit Price of Recyclables

Name of Recyclables	Average Unit price of recyclables (Ksh/kg)		Handling Weight of Recyclables per Month (kg/Month)
	Buying Price	Selling Price	
PET Bottles	3	5	1,000
Other Plastics	3	5	1,500
Carton	2	4	12,500
Other Papers	3.50	5	1700
Bottles/Glass			
Tin & Cans			
Scrap Iron			
Aluminum Cans			
Aluminum			
Copper			
Clothing	2	8	1,500

1.12 Name of Brokers・Factory Handling your Recyclable Material
Name of Buying Broker :JOSPHAT WASTE PAPERS
Name of Selling Broker :
Name of Selling Factories : CHANDARIA PAPER MILLS,MADHU PAPERS,RAINBOW PLASTICS, SUPERFOAM, WEBUYE PAPER MILLS

1.13 Do you have an expansion plan of your business? Yes___X___No_____ If "NO", Please state your reasons (i.e cost, incentive, marketing and others)

1.14 When did you start the activities?	1988
1.15 What was the main reason to start the activities?	• TO CATER FOR FAMILY NEEDS • PRESERVE THE ENVIRONMENT
1.16 What are the issues to continue/sustain the activities?	• NEED FOR FUNDS TO EXPAND • CREATION OF EMPLOYMENT

Thank you very much for your cooperation for the survey.
JICA Survey Team for Preparatory Survey for Integrated Solid Waste Management in Nairobi City
Department of Environment, City Council of Nairobi
National Environment Management Authority

QUESTIONNAIRES TO MIDDLEMANS/BROKERS OF JUNK DEALERS IN DIVISIONS
(Division Name MAKADARA Survey Date: APRIL 2010)

1.1 Name of Junkshop/Broker/Group/CBO	KAMALIZA YOUTH ENVIRONMENT GROUP		
1.2 Name of Person Reply to the Questionnaires	KENEDY OMONDI	1.3 position	CHAIRMAN
1.4 Location/Address of Business	MBOTELA		
1.5 Telephone Number	0726434479		
1.6 Registration (License) No. 17408	1.7 Number of Employees/Staff	18	
1.8 How many waste pickers supply recyclables to you?	14		
1.9 Working Lot Area (m^2)	0.25 HA		
1.10 What are the major recyclable materials handled?	PET BOTTLES,PLASTICS,CARTON,PAPERS,BOTTLES/GLASS, TINS & CANS,SCRAP IRON,ALUMINIUM CANS,ALUMINIUM,COPPER,WOOD		

1.11 Handling Quantity of Recyclables per Month and Average Unit Price of Recyclables

Name of Recyclables	Average Unit price of recyclables (Ksh/kg)		Handling Weight of Recyclables per Month (kg/Month)
	Buying Price	Selling Price	
PET Bottles	8	10	700
Other Plastics	12	20	2200
Carton	1	2.50	500
Other Papers	1	2.50	380
Bottles/Glass	3	6	3500
Tin & Cans	8	20	230
Scrap Iron	60	120	120
Aluminum Cans	80	140	40
Aluminum	190	300	30
Copper	9	20	150
Others-1（ ）			

1.12 Name of Brokers・Factory Handling your Recyclable Material
Name of Buying Broker : KAMALIZA YOUTH ENVIRONMENT GROUP
Name of Selling Broker :MAKADARA UNITED YOUTH GROUP WASTE MANAGEMENT
Name of Selling Factories : DEVANI HARIBHAI RANJI LIMITED & PREMIER LTD

1.13 Do you have an expansion plan of your business? Yes_____No__X____ If "NO", Please state your reasons (i.e cost, incentive, marketing and others) COST,INCENTIVE & MARKETING

1.14 When did you start the activities?	2005
1.15 What was the main reason to start the activities?	• WASTE REDUCTION • JOB OPPOORTUNITY
1.16 What are the issues to continue/sustain the activities?	FUNDING FOR EQUIPMENT,GEARS & TRANSPORT

Thank you very much for your cooperation for the survey.

JICA Survey Team for Preparatory Survey for Integrated Solid Waste Management in Nairobi City
Department of Environment, City Council of Nairobi
National Environment Management Authority

QUESTIONNAIRES TO MIDDLEMANS/BROKERS OF JUNK DEALERS IN DIVISIONS

(Division Name MAKADARA Survey Date: 3rd May2010)

1.1 Name of Junkshop/Broker/Group/CBO	MOSES K. WAWEERU		
1.2 Name of Person Reply to the Questionnaires	DIRECTOR	1.3 position	OWNER
1.4 Location/Address of Business	P.O.BOX 13320-00200 NAIROBI		
1.5 Telephone Number	0721692116,783278		
1.6 Registration (License) No. 17408	1.7 Number of Employees/Staff	7	
1.8 How many waste pickers supply recyclables to you?	56		
1.9 Working Lot Area (m^2)	45		
1.10 What are the major recyclable materials handled?	PLASTICS		

1.11 Handling Quantity of Recyclables per Month and Average Unit Price of Recyclables

Name of Recyclables	Average Unit price of recyclables (Ksh/kg)		Handling Weight of Recyclables per Month (kg/Month)
	Buying Price	Selling Price	
PET Bottles			
Other Plastics	12	20	28000
Carton			
Other Papers			
Bottles/Glass			
Tin & Cans			
Scrap Iron			
Aluminum Cans			
Aluminum			
Copper			
Others-1（ ）			

1.12 Name of Brokers・Factory Handling your Recyclable Material

Name of Buying Broker :

Name of Selling Broker :

Name of Selling Factories :HALLAR,KEN PLAST,SKY PLAST PREMIER INDUSTRIES.

1.13 Do you have an expansion plan of your business? Yes___X___No_____ If “NO”, Please state your reasons (i.e cost, incentive, marketing and others)

1.14 When did you start the activities?	2006
1.15 What was the main reason to start the activities?	• GENERATING INCOME • CREATING EMPLOYMENT
1.16 What are the issues to continue/sustain the activities?	FINANCIAL SUPPORT

Thank you very much for your cooperation for the survey.

JICA Survey Team for Preparatory Survey for Integrated Solid Waste Management in Nairobi City
Department of Environment, City Council of Nairobi
National Environment Management Authority

QUESTIONNAIRES TO MIDDLEMANS/BROKERS OF JUNK DEALERS IN DIVISIONS

(Division Name STAREHE Survey Date: MAY 2010)

1.1 Name of Junkshop/Broker/Group/CBO	AKINYI		
1.2 Name of Person Reply to the Questionnaires	AKINYI	1.3 position	OWNER
1.4 Location/Address of Business	MURANGA		
1.5 Telephone Number	0721966786		
1.6 Registration (License) No.		1.7 Number of Employees/Staff	6
1.8 How many waste pickers supply recyclables to you?			
1.9 Working Lot Area (m^2)			
1.10 What are the major recyclable materials handled?	POLYTHENE		

1.11 Handling Quantity of Recyclables per Month and Average Unit Price of Recyclables

Name of Recyclables	Average Unit price of recyclables (Ksh/kg)		Handling Weight of Recyclables per Month (kg/Month)
	Buying Price	Selling Price	
PET Bottles			
Other Plastics	17	20	10,000
Carton			
Other Papers			
Bottles/Glass			
Tin & Cans			
Scrap Iron			
Aluminum Cans			
Aluminum			
Copper			
Others-1 （ ）			

1.12 Name of Brokers・Factory Handling your Recyclable Material

Name of Buying Broker :

Name of Selling Broker :

Name of Selling Factories : G.N. , SUPA FOATA

1.13 Do you have an expansion plan of your business? Yes__X____No_____ If “NO”, Please state your reasons (i.e cost, incentive, marketing and others)

1.14 When did you start the activities?	2005
1.15 What was the main reason to start the activities?	SOURCE OF INCOME
1.16 What are the issues to continue/sustain the activities?	FINANCIAL ASSISTANCE

Thank you very much for your cooperation for the survey.

JICA Survey Team for Preparatory Survey for Integrated Solid Waste Management in Nairobi City
Department of Environment, City Council of Nairobi
National Environment Management Authority

QUESTIONNAIRES TO MIDDLEMANS/BROKERS OF JUNK DEALERS IN DIVISIONS

(Division Name STAREHE Survey Date: MAY 2010)

1.1 Name of Junkshop/Broker/Group/CBO	CHARLES		
1.2 Name of Person Reply to the Questionnaires	CHARLES	1.3 position	OWNER
1.4 Location/Address of Business	NORTHVIEW ROAD PANGANI		
1.5 Telephone Number	0717713220		
1.6 Registration (License) No.		1.7 Number of Employees/Staff	
1.8 How many waste pickers supply recyclables to you?	10		
1.9 Working Lot Area (m^2)	0.25 ACRE		
1.10 What are the major recyclable materials handled?	PET BOTTLES,PLASTICS,BOTTLES/GLASS,TINS&CANS,SCRAP IRON,ALUMINIUM,COPPER,SHOE SOLES		

1.11 Handling Quantity of Recyclables per Month and Average Unit Price of Recyclables

Name of Recyclables	Average Unit price of recyclables (Ksh/kg)		Handling Weight of Recyclables per Month (kg/Month)
	Buying Price	Selling Price	
PET Bottles	5	8	200
Other Plastics	10	12	250
Carton			
Other Papers			
Bottles/Glass	1	1.50	100 BOTTLES
Tin & Cans	15	17	100
Scrap Iron	15	17	100
Aluminum Cans			
Aluminum	60	80	30
Copper	150	200	30
Others-1（ ）	10	13	50

1.12 Name of Brokers・Factory Handling your Recyclable Material

Name of Buying Broker :CHARLES

Name of Selling Broker :

Name of Selling Factories :

1.13 Do you have an expansion plan of your business? Yes_____No___X___ If “NO”, Please state your reasons (i.e cost, incentive, marketing and others) LACK OF INCENTIVES

1.14 When did you start the activities?	2005
1.15 What was the main reason to start the activities?	UNEMPLOYMENT
1.16 What are the issues to continue/sustain the activities?	FINANCE

Thank you very much for your cooperation for the survey

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JICA Survey Team for Preparatory Survey for Integrated Solid Waste Management in Nairobi City
Department of Environment, City Council of Nairobi
National Environment Management Authority

QUESTIONNAIRES TO MIDDLEMANS/BROKERS OF JUNK DEALERS IN DIVISIONS
(Division Name STAREHE Survey Date: MAY 2010)

1.1 Name of Junkshop/Broker/Group/CBO	MAINA SCRAPS		
1.2 Name of Person Reply to the Questionnaires	MAINA	1.3 position	MANAGER
1.4 Location/Address of Business	MLANGO KUBWA BARIDI ROAD		
1.5 Telephone Number	0727713569		
1.6 Registration (License) No.		1.7 Number of Employees/Staff	
1.8 How many waste pickers supply recyclables to you?	40		
1.9 Working Lot Area (m^2)	15		
1.10 What are the major recyclable materials handled?	PET BOTTLES,PLASTICS,BOTTLELS/GLASS,TIN&CANS,SCRAP IRON,ALUMINIUM CANS,ALUMINIUM,COPPER,SHOE SOLES,BRASS		

1.11 Handling Quantity of Recyclables per Month and Average Unit Price of Recyclables

Name of Recyclables	Average Unit price of recyclables (Ksh/kg)		Handling Weight of Recyclables per Month (kg/Month)
	Buying Price	Selling Price	
PET Bottles	5	10	300
Other Plastics	10	13	1200
Carton			
Other Papers			
Bottles/Glass	0.50	1	2000 BOTTLES
Tin & Cans	15	20	1000
Scrap Iron	15	20	15000
Aluminum Cans	15	30	40
Aluminum	70	100	100
Copper	200	300	50
Shoe soles	15	20	300
Brass	170	250	20
Cables	10	20	50

1.12 Name of Brokers・Factory Handling your Recyclable Material
Name of Buying Broker :MAINA
Name of Selling Broker :
Name of Selling Factories : KEN-PLASTIC,BOCHU INDUSTRY,ROLL MILL INDUSTRY

1.13 Do you have an expansion plan of your business? Yes___X___No_____ If "NO", Please state your reasons (i.e cost, incentive, marketing and others)

1.14 When did you start the activities?	2005
1.15 What was the main reason to start the activities?	SOURCE OF LIVELIHOOD
1.16 What are the issues to continue/sustain the activities?	

Thank you very much for your cooperation for the survey.
JICA Survey Team for Preparatory Survey for Integrated Solid Waste Management in Nairobi City
Department of Environment, City Council of Nairobi
National Environment Management Authority

QUESTIONNAIRES TO MIDDLEMANS/BROKERS OF JUNK DEALERS IN DIVISIONS

(Division Name STAREHE Survey Date: MAY 2010)

1.1 Name of Junkshop/Broker/Group/CBO	JAMES		
1.2 Name of Person Reply to the Questionnaires	JAMES	1.3 position	OWNER
1.4 Location/Address of Business	IRUNGOREKE		
1.5 Telephone Number			
1.6 Registration (License) No.		1.7 Number of Employees/Staff	3
1.8 How many waste pickers supply recyclables to you?	20		
1.9 Working Lot Area (m^2)			
1.10 What are the major recyclable materials handled?	METAL		

1.11 Handling Quantity of Recyclables per Month and Average Unit Price of Recyclables

Name of Recyclables	Average Unit price of recyclables (Ksh/kg)		Handling Weight of Recyclables per Month (kg/Month)
	Buying Price	Selling Price	
PET Bottles			
Other Plastics			
Carton			
Other Papers			
Bottles/Glass			
Tin & Cans	15	20	50
Scrap Iron	15	20	100
Aluminum Cans	60	80	70
Aluminum	70	100	60
Copper	150	180	30
Others-1（ ）			

1.12 Name of Brokers・Factory Handling your Recyclable Material

Name of Buying Broker :

Name of Selling Broker :

Name of Selling Factories :

1.13 Do you have an expansion plan of your business? Yes___X___No_____ If “NO”, Please state your reasons (i.e cost, incentive, marketing and others)

1.14 When did you start the activities?	2007
1.15 What was the main reason to start the activities?	SOURCE OF INCOME
1.16 What are the issues to continue/sustain the activities?	MONEY

Thank you very much for your cooperation for the survey.

JICA Survey Team for Preparatory Survey for Integrated Solid Waste Management in Nairobi City
Department of Environment, City Council of Nairobi
National Environment Management Authority

QUESTIONNAIRES TO MIDDLEMANS/BROKERS OF JUNK DEALERS IN DIVISIONS
(Division Name WESTLANDS Survey Date: MAY 2010)

1.1 Name of Junkshop/Broker/Group/CBO	CRESCENT ROAD RECUCLERS		
1.2 Name of Person Reply to the Questionnaires	DAVID MUYA	1.3 position	OWNER
1.4 Location/Address of Business	PARKLANDS		
1.5 Telephone Number	0726879027		
1.6 Registration (License) No.	1.7 Number of Employees/Staff	4	
1.8 How many waste pickers supply recyclables to you?	20		
1.9 Working Lot Area (m^2)	10		
1.10 What are the major recyclable materials handled?	PAPERS		

1.11 Handling Quantity of Recyclables per Month and Average Unit Price of Recyclables

Name of Recyclables	Average Unit price of recyclables (Ksh/kg)		Handling Weight of Recyclables per Month (kg/Month)
	Buying Price	Selling Price	
PET Bottles			
Other Plastics			
Carton			
Other Papers	3	4	5000
Bottles/Glass			
Tin & Cans			
Scrap Iron			
Aluminum Cans			
Aluminum			
Copper			
Others-1 （ ）			

1.12 Name of Brokers・Factory Handling your Recyclable Material
Name of Buying Broker :CRESCENT ROAD RECYCLERS
Name of Selling Broker :
Name of Selling Factories : CHADARIA

1.13 Do you have an expansion plan of your business? Yes__X____No_____ If “NO”, Please state your reasons (i.e cost, incentive, marketing and others) LACK OF INCENTIVES

1.14 When did you start the activities?	2000
1.15 What was the main reason to start the activities?	UNEMPLOYMENT
1.16 What are the issues to continue/sustain the activities?	PROFITABILITY

Thank you very much for your cooperation for the survey.

JICA Survey Team for Preparatory Survey for Integrated Solid Waste Management in Nairobi City
Department of Environment, City Council of Nairobi
National Environment Management Authority

QUESTIONNAIRES TO MIDDLEMANS/BROKERS OF JUNK DEALERS IN DIVISIONS
(Division Name WESTLANDS Survey Date: MAY 2010)

1.1 Name of Junkshop/Broker/Group/CBO	CROSS ROAD RECYCLERS		
1.2 Name of Person Reply to the Questionnaires	JEREMIAH	1.3 position	
1.4 Location/Address of Business			
1.5 Telephone Number	0721286744		
1.6 Registration (License) No.		1.7 Number of Employees/Staff	4
1.8 How many waste pickers supply recyclables to you?	20		
1.9 Working Lot Area (m^2)	50		
1.10 What are the major recyclable materials handled?	PAPERS,PLASTICS,SCRAP IRON,COPPER		

1.11 Handling Quantity of Recyclables per Month and Average Unit Price of Recyclables

Name of Recyclables	Average Unit price of recyclables (Ksh/kg)		Handling Weight of Recyclables per Month (kg/Month)
	Buying Price	Selling Price	
Current Year			
PET Bottles			
Other Plastics	10	12	1500
Carton			
Other Papers	2	3.50	5000
Bottles/Glass			
Tin & Cans			
Scrap Iron	20	22	10000
Aluminum Cans			
Aluminum			
Copper	80	100	500
Others-1（ ）			

1.12 Name of Brokers・Factory Handling your Recyclable Material
Name of Buying Broker :CROSS ROAD RECYCLERS
Name of Selling Broker :
Name of Selling Factories : CHADARIA

1.13 Do you have an expansion plan of your business? Yes___X___No_____ If “NO”, Please state your reasons (i.e cost, incentive, marketing and others)

1.14 When did you start the activities?	2000
1.15 What was the main reason to start the activities?	EMPLOYMENT
1.16 What are the issues to continue/sustain the activities?	PROFITABLILITY

Thank you very much for your cooperation for the survey.

JICA Survey Team for Preparatory Survey for Integrated Solid Waste Management in Nairobi City
Department of Environment, City Council of Nairobi
National Environment Management Authority

QUESTIONNAIRES TO MIDDLEMANS/BROKERS OF JUNK DEALERS IN DIVISIONS

(Division Name WESTLANDS Survey Date: 12th May 2010)

1.1 Name of Junkshop/Broker/Group/CBO	DAVID KURIA M.		
1.2 Name of Person Reply to the Questionnaires	DAVID KURIA M.	1.3 position	
1.4 Location/Address of Business	CHIROMO		
1.5 Telephone Number	0726878555		
1.6 Registration (License) No.		1.7 Number of Employees/Staff	2
1.8 How many waste pickers supply recyclables to you?	20		
1.9 Working Lot Area (m^2)	6		
1.10 What are the major recyclable materials handled?	PLASTICS,SCRAP IRON,PET BOTTLES,TIN & CANS		

1.11 Handling Quantity of Recyclables per Month and Average Unit Price of Recyclables

Name of Recyclables	Average Unit price of recyclables (Ksh/kg)		Handling Weight of Recyclables per Month (kg/Month)
	Buying Price	Selling Price	
PET Bottles	1	2	800
Other Plastics	7	10	200
Carton			
Other Papers			
Bottles/Glass			
Tin & Cans	10	13	300
Scrap Iron	15	18	500
Aluminum Cans			
Aluminum			
Copper			
Others-1 （ ）			

1.12 Name of Brokers・Factory Handling your Recyclable Material

Name of Buying Broker :DAVID KURIA MURILU

Name of Selling Broker :PETER GICHARU

Name of Selling Factories :

1.13 Do you have an expansion plan of your business? Yes___X___No_____ If “NO”, Please state your reasons (i.e cost, incentive, marketing and others)

1.14 When did you start the activities?	2009
1.15 What was the main reason to start the activities?	SELF EMPLOYMENT
1.16 What are the issues to continue/sustain the activities?	PROFITABILITY

Thank you very much for your cooperation for the survey.

JICA Survey Team for Preparatory Survey for Integrated Solid Waste Management in Nairobi City
Department of Environment, City Council of Nairobi
National Environment Management Authority

QUESTIONNAIRES TO MIDDLEMANS/BROKERS OF JUNK DEALERS IN DIVISIONS
(Division Name WESTLANDS Survey Date: 14th MAY 2010)

1.1 Name of Junkshop/Broker/Group/CBO	DANIEL NDUNGU		
1.2 Name of Person Reply to the Questionnaires	DANIEL NDUNGU	1.3 position	
1.4 Location/Address of Business	CRESCENT LANE		
1.5 Telephone Number	0720174226		
1.6 Registration (License) No.		1.7 Number of Employees/Staff	4
1.8 How many waste pickers supply recyclables to you?	30		
1.9 Working Lot Area (m^2)	5		
1.10 What are the major recyclable materials handled?	PLASTICS,METAL		

1.11 Handling Quantity of Recyclables per Month and Average Unit Price of Recyclables

Name of Recyclables	Average Unit price of recyclables (Ksh/kg)		Handling Weight of Recyclables per Month (kg/Month)
	Buying Price	Selling Price	
PET Bottles			
Other Plastics	10	13	4000
Carton			
Other Papers			
Bottles/Glass			
Tin & Cans			
Scrap Iron			
Aluminum Cans			
Aluminum			
Copper			
Others-1 (Metal-Steel)	18	22	4800
Others-2（ ）			

1.12 Name of Brokers・Factory Handling your Recyclable Material
Name of Buying Broker :NDUNGU
Name of Selling Broker :MAMA GEORGE
Name of Selling Factories :

1.13 Do you have an expansion plan of your business? Yes___X___No_____ If “NO”, Please state your reasons (i.e cost, incentive, marketing and others)

1.14 When did you start the activities?	2000
1.15 What was the main reason to start the activities?	EMPLOYMENT
1.16 What are the issues to continue/sustain the activities?	PROFITABLILITY

Thank you very much for your cooperation for the survey.

JICA Survey Team for Preparatory Survey for Integrated Solid Waste Management in Nairobi City
Department of Environment, City Council of Nairobi
National Environment Management Authority

QUESTIONNAIRES TO MIDDLEMANS/BROKERS OF JUNK DEALERS IN DIVISIONS

(Division Name DAGORETTI Survey Date: 6th May 2010)

1.1 Name of Junkshop/Broker/Group/CBO	SIMON CHEGE		
1.2 Name of Person Reply to the Questionnaires	SIMON CHEGE	1.3 position	
1.4 Location/Address of Business	GITANGA ROAD		
1.5 Telephone Number	0721428797		
1.6 Registration (License) No.		1.7 Number of Employees/Staff	SOLE
1.8 How many waste pickers supply recyclables to you?	STREET BOYS		
1.9 Working Lot Area (m^2)			
1.10 What are the major recyclable materials handled?	PLASTICS		

1.11 Handling Quantity of Recyclables per Month and Average Unit Price of Recyclables

Name of Recyclables	Average Unit price of recyclables (Ksh/kg)		Handling Weight of Recyclables per Month (kg/Month)
	Buying Price	Selling Price	
PET Bottles			
Other Plastics	5	8	1000
Carton			
Other Papers			
Bottles/Glass			
Tin & Cans			
Scrap Iron			
Aluminum Cans			
Aluminum			
Copper			
Others-1 （ ）			

1.12 Name of Brokers・Factory Handling your Recyclable Material

Name of Buying Broker :SIMON CHEGE

Name of Selling Broker :

Name of Selling Factories : SKY PLAST LTD.

1.13 Do you have an expansion plan of your business? Yes_____No_____ If “NO”, Please state your reasons (i.e cost, incentive, marketing and others) LACK OF INCENTIVES

1.14 When did you start the activities?	2005
1.15 What was the main reason to start the activities?	SELF EMPLOYMENT
1.16 What are the issues to continue/sustain the activities?	

Thank you very much for your cooperation for the survey.

JICA Survey Team for Preparatory Survey for Integrated Solid Waste Management in Nairobi City
Department of Environment, City Council of Nairobi
National Environment Management Authority

QUESTIONNAIRES TO MIDDLEMANS/BROKERS OF JUNK DEALERS IN DIVISIONS

(Division Name DAGORETTI Survey Date: 6th May 2010)

1.1 Name of Junkshop/Broker/Group/CBO	DAVID MBURU		
1.2 Name of Person Reply to the Questionnaires	DAVID MBURU	1.3 position	
1.4 Location/Address of Business	KAWANGWARE;NAIVASHA ROAD ;DELIVERANCE		
1.5 Telephone Number	0720716337		
1.6 Registration (License) No.		1.7 Number of Employees/Staff	3
1.8 How many waste pickers supply recyclables to you?			
1.9 Working Lot Area (m^2)			
1.10 What are the major recyclable materials handled?	PLASTICS,SCRAP IRON		

1.11 Handling Quantity of Recyclables per Month and Average Unit Price of Recyclables

Name of Recyclables	Average Unit price of recyclables (Ksh/kg)		Handling Weight of Recyclables per Month (kg/Month)
	Buying Price	Selling Price	
PET Bottles			
Other Plastics	5	8	180
Carton			
Other Papers			
Bottles/Glass			
Tin & Cans			
Scrap Iron	8	10	250
Aluminum Cans			
Aluminum			
Copper			
Others-1（ ）			

1.12 Name of Brokers・Factory Handling your Recyclable Material

Name of Buying Broker :DAVID MBURU

Name of Selling Broker :

Name of Selling Factories :

1.13 Do you have an expansion plan of your business? Yes_____No_____ If “NO”, Please state your reasons (i.e cost, incentive, marketing and others) LACK OF INCENTIVES

1.14 When did you start the activities?	2006
1.15 What was the main reason to start the activities?	SELF EMPLOYMENT
1.16 What are the issues to continue/sustain the activities?	

Thank you very much for your cooperation for the survey.

JICA Survey Team for Preparatory Survey for Integrated Solid Waste Management in Nairobi City
Department of Environment, City Council of Nairobi
National Environment Management Authority

3. Result of Waste Pickers Survey

Q.N.O.	Name of Landfill	Name	broker/not	Sex	Age	Nationality	House location	No. of family members	Total Members of family at site			Ave income/ month	Days worked per week/others	Working hrs	Type of job	Other job	Income/month	Years at landfill	Previuos job	Sell recyclables to	brokers trading with recyclabes	Frequency of selling recyclables	Direct recycling manufacturers	Problems at landfill	Still want to work as a scavenger in future
									Female	Male	Age														
1	DANDORA	NJOGU	does not work for a broker	MALE	60	LOCAL	800M	5		1	60	6,500	7	6am - 6pm	Permanent	None	N/A	29	Service business	Broker	More than 5	daily	N/A	None	No, if I can get a better and permanent job
2	DANDORA	SIMON	works for a broker	MALE	26	LOCAL	1KM	1		1	26	7,000	7	5am - 8pm	Permanent	None	N/A	8	NONE	Direct selling to recycling manufacturers	More than 5	daily	more than 5	None	No, if I can get a better and permanent job
3	DANDORA	MAMA LUCY	works for broker	FEMALE	45	LOCAL	10KM	3	1		45	6,000	7	6am - 6pm	Permanent	None	N/A	9	Company worker	Direct selling to recycling manufacturers	More than 5	daily	more than 5	None	Yes, as a part time only for additional income
4	DANDORA	MARY	works for broker	FEMALE	32	LOCAL	650M	4	1		32	5,000	7	6am - 6pm	Permanent	None	N/A	4	Company worker	Direct selling to recycling manufacturers	More than 5	once a month	more than 5	None	No, if I can get a better and permanent job
5	DANDORA	KINUTHIA	works for broker	MALE	35	LOCAL	15KM	6		1	35	9,000	7	6am - 7pm	Permanent	None	N/A	7	Service business	Direct selling to recycling manufacturers	More than 5	once a month	more than 5	None	No, if I can get a better and permanent job
6	DANDORA	OLOO	does not work for a broker	MALE	37	LOCAL	20M	4		1	36	8,000	7	6am - 7pm	Permanent	None		3	NONE	Brokers	More than 5	twice a month	N/A	None	I don't know
7	DANDORA	JOYCE	does not work for a broker	FEMALE	22	LOCAL	3KM	3	1		30	6,200	7	8AM - 8PM	Permanent	None	N/A	3	NONE	Brokers	three	daily	N/A	None	Yes, as a part time only for additional income
8	DANDORA	ALEX	does not work for a broker	MALE	26	LOCAL	25KM	1		1	26	6,000	7	6AM - 8PM	Permanent	None	N/A	9	NONE	Brokers	three	daily	N/A	None	Yes I would like to work as long as possible
9	DANDORA	KIMANI	does not work for a broker	MALE	18	LOCAL	12km	1		1	18	7,000	7	6AM - 7PM	Permanent	None	N/A	3	NONE	Brokers	two	daily	N/A	None	Yes I would like to work as long as possible
10	DANDORA	MAMA BRIAN	does not work for a broker	FEMALE	34	LOCAL	500m	4	1		34	5,000	7	8am - 7pm	Permanent	None	N/A	10	Farming	Brokers	Four	daily	N/A	None	Yes I would like to work as long as possible
					34							6570													

4. Cost Estimates of Composting Facilities and MRF Centre

Table 4.1.1 Cost Estimate of 10 ton/day Pilot Compost Plant

Cost of 10 ton/day Pilot Compost Plant					
Item No.	Description	Unit	Quantity	Unit Cost	Total
1	Civil Work				
1.1	Site Clearing and Grubbing, 0.2m(D)	m^2	4,000	180	720,000
1.2	Disposal of Excess Soil	m^3	1,200	1,040	1,248,000
1.3	Earth Filling & Compaction, 0.5m(D)	m^3	816	1,180	962,880
1.4	Premise Road, AS Pavement, 3.5m (W) x 110m(L)	m^2	385	3,950	1,520,750
1.5	Entrance Yard, RC 12m(W) x 20m(L)x 0.15m	m^2	240	3,150	756,000
1.6	Drainage (Stone Rip Lap Channel), 0.3-0.6 m x 0.26m(D)	m	324	3,000	972,000
1.7	Barbed Wire Fencing, H2.5m	m	274	2,600	712,400
1.8	Steel Gate, 2.5m(H) x 6m (W) incl. installation	ls	1		450,000
Subtotal-Civil Work					7,342,030
2	Building Work				
2.1	Compost Plant Building, 30m(W) x 64m(L)	m^2	1,920	15,000	28,800,000
2.2	Guard House	m^2	9	22,500	202,500
2.3	Utilities (Water Supply, Power Supply)	ls	1		1,000,000
2.4	Septic Tank	ls	1		500,000
Subtotal-Building Work					30,502,500
3	Equipment				
3.1	Weigh Bridge (30 ton), incl. installation	unit	1	2,313,000	2,313,000
3.2	Shredder (22.5kW)	unit	1	1,000,000	1,000,000
3.3	Granulator (7.5 kW)	unit	1	500,000	500,000
3.4	Electric Sieve (7.5kW)	unit	1	500,000	500,000
3.5	Packing Machine	unit	1	500,000	500,000
3.6	Horizontal Conveyor, 0.9m(W) x 9m(H), incl. installation	unit	1	2,700,000	2,700,000
3.7	Inclined Conveyor, 0.9m(W) x 4m (H), incl. installation	unit	1	1,500,000	1,500,000
3.8	Wheel Loader, 75kW, Bucket 1.5~2m3	unit	2	15,000,000	30,000,000
3.9	2ton Open Truck	unit	1	2,000,000	2,000,000
3.10	Water Jet Pump, Hose & Nozzle	unit	1	70,000	70,000
3.11	Tools & Equipment	ls	1		100,000
Subtotal-Equipment					41,013,000
Total-Direct Cost					78,857,530
Overhead Cost (25%)					19,714,383
Total-Construction Cost					98,571,913
Engineering Cost (10%)					9,857,191
Total Construction Cost including Engineering Cost					108,429,104
Price Contingency (10%)					9,857,191
Physical Contingency (10%)					9,857,191
Total Construction Cost of 10 ton /day Pilot Compost Plan-per plant					128,143,486
Total No. of Pilot Plant (10 ton/day) x 4 plants)					4
Grand Total of Pilot Plant Project Cost					512,573,945

Table 4.1.2 Cost Estimates of 200 kg/day Pilot Community Compost Plant

Cost of 200 kg/day Community Compost Plant

Item No.	Description	Unit	Quantity	Unit Cost	Total Cost
1	Civil Work				
1.1	Site Clearing and Grubbing, 0.2m(D)	m^2	1,250	180	225,000
1.2	Disposal of Excess Soil	m^3	250	1,040	260,000
1.3	Earth Filling & Compaction, 0.4m(D)	m^3	275	1,180	324,500
1.4	Premise Road, Gravel Compaction 3.5m (W) x 40m(L)	m^3	21	11,700	245,700
1.5	Entrance Yard, RC Pavement, 12m(W) x 12m(L)x 0.15m(D)	m^2	80	3,150	252,000
1.6	Drainage (RC Open Channel),0.3-0.6m(W)x0.26m(D)	m	154	3,000	462,000
1.7	Barbed Wire Fencing, H2.5m	m	144	2,600	374,400
1.8	Steel Gate, 2.5m(H) x 6m (W) incl. installation	ls	1		225,000
Subtotal-Civil Work					2,368,600
2	Building Work				
2.1	Compost Plant Building	m^2	125	15,000	1,875,000
2.2	Guard House	m^2	9	22,500	202,500
2.3	Utilities (Water Supply, Power Supply)	ls	1		200,000
2.4	Septic Tank	ls	1		200,000
Subtotal-Building Work					2,477,500
3	Equipment				
3.1	Platform Scale, 0-150kg	unit	1	50,000	50,000
3.2	Shredder (3.75kW)	unit	1	500,000	500,000
3.3	Manual Sieve, Stainless Steel Net & Stand	unit	1	50,000	50,000
3.4	Plastic Container, 50Lit	unit	30	800	24,000
3.5	Hand Cart	unit	2	18,000	36,000
3.6	Electric Thermometer	pc	1	10,000	10,000
3.7	Water Jet Pump, Hose & Nozzle	unit	1	70,000	70,000
3.8	Tools & Equipment	ls	1		50,000
Subtotal-Equipment					790,000
Total-Direct Cost					5,636,100
Overhead Cost (25%)					1,409,025
Total-Construction Cost					7,045,125
Engineering Cost (10%)					704,513
Total Construction Cost including Engineering Cost					7,749,638
Price Contingency (10%)					704,513
Physical Contingency (10%)					704,513
Total Project Cost of 200 kg/day Community Compost Plant per plant					9,158,663
Total No. of Community Compost Plant					8
Grand Total of 200 kg/day Pilot Community Compost Plant Project Cost					73,269,300

Table 4.1.3 Cost Estimates for Implementation of Pilot Home Composting

Cost for Implementation of Pilot Home Composting (cost per 50 houses)						
Item No.	Description	Unit	Quantity	Unit Cost	Total Cost	Remarks
1	Home Composting Material & Equipment					
1.1	Plastic Container with Lining, 40Lit.	pc	100	700	70,000	2 per house
1.2	Plastic Container, 2Lit.	pc	100	300	30,000	2 per house
1.3	Material for Seeding Liquid, 3 months	ls	1		30,000	
1.4	Misce. Tools for Seeding Liquid	ls	1		25,000	
1.5	Electronic Kitchen Scale	pc	1	5,000	5,000	for Instructor
1.6	Pamphlet for Home Composting	set	50	50	2,500	
1.7	Facilitator/Instructor, 1 person	man/month	2	383,500	767,000	2 working areas
1.8	Assistant Facilitator/Instructor	man/month	3	127,833	383,500	
Total-Home Composting Material and Equipment					1,313,000	3months per area
Total-Direct Cost					1,313,000	
Overhead Cost (0%)					0	
Total-Cost for Implementation of Home Composting					1,313,000	
Engineering Cost (0%)					0	
Price Contingency (0%)					0	
Physical Contingency (0%)					0	
Total Project Cost for 50 Home Composting for 3 months					1,313,000	
Total No. of Pilot Home Composting Area					8	
Grand Total of Pilot Plant Project Cost					10,504,000	

Table 4.1.4 Cost Estimates of MRF Centre at Dandora

Construction Cost of MRF Centre at Dandora (including 4ton/day Pilot Compost Plant)					
Item No.	Description	Unit	Quantity	Unit Cost	Total Cost
1	Civil Work				
1.1	Site Clearing and Grubbing, 0.2m (D)	m^2	4,000	180	720,000
1.2	Disposal of Excess Soil	m^3	12,000	1,040	12,480,000
1.3	Earth Filling & Compaction, 0.5m(D)	m^3	816	1,180	962,880
1.4	Premise Road, AS Pavement, 3.5m (W) x 110m(L)	m^2	385	3,950	1,520,750
1.5	Entrance Yard, RC 12m(W) x 20m(L)x 0.15m	m^2	240	3,150	756,000
1.6	Drainage (Stone Rip Lap Channel), 0.3-0.6 m x 0.26m(D)	m	324	3,000	972,000
1.7	Barbed Wire Fencing, H2.5m	m	274	2,600	712,400
1.8	Steel Gate, 2.5m(H) x 6m (W) incl. installation	ls	1		450,000
1.9					
Subtotal-Civil Work					18,574,030
2	Building Work				
2.1	MRF Center & Compost Plant Building, 30m(W) x 64m(L)	m^2	1,920	15,000	28,800,000
2.2	Guard House	m^2	9	22,500	202,500
2.3	Utilities (Water Supply, Power Supply)	ls	1		1,000,000
2.4	Septic Tank	ls	1		500,000
2.5					
Subtotal-Building Work					30,502,500
3	Equipment				
3.1	Weigh Bridge (30 ton), incl. installation	unit	1	2,313,000	2,313,000
3.2	Shredder (22.5kW)	unit	1	1,000,000	1,000,000
3.3	Granulator (7.5 kW)	unit	1	500,000	500,000
3.4	Electric Sieve (7.5kW)	unit	1	500,000	500,000
3.5	Packing Machine	unit	1	500,000	500,000
3.6	Horizontal Conveyor, 0.9m(W) x 9m(H), incl. installation	unit	1	2,700,000	2,700,000
3.7	Inclined Conveyor, 0.9m(W) x 4m (H), incl. installation	unit	1	1,500,000	1,500,000
3.8	Wheel Loader, 75kW, Bucket 1.5~2m3	unit	1	15,000,000	15,000,000
3.9	2ton Open Truck	unit	1	2,000,000	2,000,000
3.10	Water Jet Pump, Hose & Nozzle	unit	1	70,000	70,000
3.11	Platform Scale (0-200kg)	unit	1	50,000	50,000
3.12	Tools & Equipment (Wheel Barrows, Shovels, Plows, etc.)	ls	1		500,000
3.13	Computer Set	ls	1		400,000
Subtotal-Equipment					27,033,000
Total-Direct Cost					76,109,530
Overhead Cost (25%)					19,027,383
Total-Construction Cost					95,136,913
Engineering Cost (10%)					9,513,691
Total Construction Cost including Engineering Cost					104,650,604
Price Contingency (10%)					9,513,691
Physical Contingency (10%)					9,513,691
Total Project Cost of MRF Centre at Dandora					123,677,986

REPARATORY SURVEY
FOR
INTEGRATED SOLID WASTE MANAGEMENT
IN NAIROBI CITY
IN
THE REPUBLIC OF KENYA

FINAL REPORT

VOLUME 4

DATA BOOK

SECTION E

FINAL DISPOSAL

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1. Cost Estimation of Construction of New Landfill Site

Table 1.1.1 Summarised Landfill Site Estimation Results (1000KSh)

Item		**Option 1**	**Option 2**	**Option 3**
		Ruai	**Ruai + Juja**	**Ruai + Mavoko**
Waste Amount (m^3)	Ruai	12,670,000	8,490,000	8,490,000
	Juja or Mavoko	0	4,180,000	4,180,000
Land Acquisition		0	108,000	79,000
Construction	Main	4,961,000	5,180,000	5,585,000
	Enclosure Dike	2,916,660	2,506,950	3,064,230
Engineering Fee (Construction Main×10%)		496,100	518,000	558,500
O&M (2017 to 2030)		2,674,080	3,228,880	2,825,860
Procurement of Heavy Machine Equipment		268,300	280,600	280,600
Sub-Total		**11,316,140**	**11,822,430**	**12,393,190**
Physical Contingency*		837,376	820,495	920,773
Total		**12,153,516**	**12,642,925**	**13,313,963**

Note: * Physical Contingency is calculated as 10% of construction cost and engineering services cost.

1.1 Construction Cost (Main)

(1) Option 1 (Ruai)

Table 1.1.2 Construction Cost (Option 1: Ruai 12,670,000 m^3)

No.	Item / Work		Unit	Quantity		Unit Price	Amount Cost (x 1000 Ksh.)		
				1st phase	2nd phase	(Ksh)	1st phase	2nd phase	Total
1. Land Acquisition			m^2	0	0	300	0	0	0
2. Civil & Building									
2.1	Structure for solid waste retaining	Excavating(clay)	m^3	357,500	285,900	890	318,175	254,451	572,626
		Excavating(rock)	m^3	1,013,500	253,700	1,600	1,621,600	405,920	2,027,520
		Embankment	m^3	34,400	75,400	1,080	37,152	81,432	118,584
		Surplus soil filling	m^3	1,332,800	455,800	120	159,936	54,696	214,632
		Seed spraying	m^2	37,900	30,800	520	19,708	16,016	35,724
2.2	Leachate collection and durain	Drain pipe main	m	3,713	2,228	19,528	72,507	43,508	116,015
		Drain pipe branch	m	5,316	4,519	6,709	35,665	30,318	65,983
		Reservoir pit	unit	3	0	1,563,840	4,692	0	4,692
2.3	Leachate treatment pond	Excavating(clay)	m^3	42,950	42,050	890	38,226	37,425	75,651
		Excavating(rock)	m^3	42,950	42,050	1,600	68,720	67,280	136,000
		Surplus soil filling	m^3	85,900	84,100	120	10,308	10,092	20,400
		Liner laying	m^2	8,500	8,500	1,000	8,500	8,500	17,000
		Connection drainage	m	82	110	3,000	246	330	576
2.4	Gas exhaust equipment	Vertcal type PVC200mm	unit	106	89	8,696	922	774	1,696
		Side slope PVC200mm	m	24	16	3,480	84	56	140
2.5	Rainwater drainage	600-300×260	m	0	787	3,000	0	2,361	2,361
		900-600×260	m	787	0	4,000	3,148	0	3,148
		900-300×520	m	1,861	324	5,000	9,305	1,620	10,925
		1200-600×520	m	1,850	0	6,000	11,100	0	11,100
2.6	Access road	In site W=8m	m^2	33,680	8,400	3,950	133,036	33,180	166,216
		Out site Crashed stone W=8m	m^3	14,400	0	11,700	168,480	0	168,480
2.7	Onsite road	Crashed stone W=8m	m^3	2,920	2,920	11,700	34,164	34,164	68,328
2.8	Well for groundwater monitoring L=10m φ100mm		unit	2	0	521,000	1,042	0	1,042
2.9	Net fence	H=2.5m	m	3,600	0	12,000	43,200	0	43,200
2.10	Gate	H=2.5m W=8m	unit	2	0	450,000	900	0	900
2.11	Warehouse	Domestic hazardous waste	unit	1	0	30,000,000	30,000	0	30,000
		Heavy machine	unit	1	0	45,000,000	45,000	0	45,000
2.12	Administrative facilities	Control office	unit	1	0	14,000,000	14,000	0	14,000
		Car wash equipment	unit	1	0	400,000	400	0	400
		Septic tank $10m^3$	unit	5	0	90,000	450	0	450
Sub Total							2,890,666	1,082,123	3,972,789
Overhead (Sub Total*25%(1/2product expense removes))							698,174	262,877	961,051
Total of Civil & Building							3,588,840	1,345,000	4,933,840
3. Equipment & Facility									0
3.1	Truck scale	Capacity 40t	unit	2	0	1,850,000	3,700	0	3,700
3.2	Pump Installing work	6.6kwh	unit	5	0	360,000	1,800	0	1,800
3.3	Piping work	φ100mm	m	3,300	0	5,650	18,645	0	18,645
Sub Total							24,145	0	24,145
Overhead (Sub Total*25%(1/2product expense removes))							3,015	0	3,015
Total of Equipment & Facility							27,160	0	27,160
Total of Construction							3,616,000	1,345,000	4,961,000
Engineering (10%)							361,600	134,500	496,100
Grand Total							3,977,600	1,479,500	5,457,100

(2) Option 2 (Ruai + Juja)

Table 1.1.3 Total Construction Cost of Option 2 (1000KSh)

Item	Ruai	Juja	Total
Waste Amount (m^3)	8,490,00	4,180,000	12,670,000
Land Acquisition	0	108,000	108,000
Construction	3,328,000	1,852,000	5,180,000
Engineering Fee (Construction × 10%)	332,800	185,200	518,000
Total	**3,660,800**	**2,145,200**	**5,806,000**

(a) Ruai

Table 1.1.4 Construction Cost (Option 2: Ruai 8,490,000 m^3)

No.	Item / Work		Unit	Quantity		Unit Price	Amount Cost (x 1000 Ksh.)		
				1st phase	2nd phase	(Ksh)	1st phase	2nd phase	Total
1. Land Acquisition			m^2	0	0	300	0	0	0
2. Civil & Building									
2.1	Structure for solid waste retaining	Excavating(clay)	m^3	228,267	191,098	890	203,158	170,077	373,235
		Excavating(rock)	m^3	647,128	169,575	1,600	1,035,405	271,320	1,306,725
		Embankment	m^3	21,965	50,398	1,080	23,722	54,430	78,152
		Surplus soil filling	m^3	851,004	304,661	120	102,120	36,559	138,679
		Seed spraying	m^2	24,199	20,587	520	12,583	10,705	23,288
2.2	Leachate collection and darain	Drain pipe main	m	2,371	1,489	19,528	46,301	29,077	75,378
		Drain pipe branch	m	3,394	3,021	6,709	22,770	20,268	43,038
		Reservoir pit	unit	3	0	1,563,840	4,692	0	4,692
2.3	Leachate treatment pond	Excavating(clay)	m^3	27,424	28,107	890	24,407	25,015	49,422
		Excavating(rock)	m^3	27,424	28,107	1,600	43,878	44,971	88,849
		Surplus soil filling	m^3	54,848	56,213	120	6,582	6,746	13,328
		Liner laying	m^2	5,427	5,681	1,000	5,427	5,681	11,108
		Connection drainage	m	52	74	3,000	156	222	378
2.4	Gas exhaust equipment	Vertcal type PVC200mm	unit	68	59	8,696	591	513	1,104
		Side slope PVC200mm	m	15	11	3,480	52	38	90
2.5	Rainwater drainage	600-300×260	m	0	526	3,000	0	1,578	1,578
		900-600×260	m	503	0	4,000	2,012	0	2,012
		900-300×520	m	1,188	217	5,000	5,940	1,085	7,025
		1200-600×520	m	1,181	0	6,000	7,086	0	7,086
2.6	Access road	In site W=8m	m^2	21,505	5,615	3,950	84,945	22,179	107,124
		Out site Crashed stone W=8m	m^3	14,400	0	11,700	168,480	0	168,480
2.7	Onsite road	Crashed stone W=8m	m^3	1,864	1,952	11,700	21,809	22,838	44,647
2.8	Well for groundwater monitoring L=10m φ100mm		unit	2	0	521,000	1,042	0	1,042
2.9	Net fence	H=2.5m	m	2,299	0	12,000	27,588	0	27,588
2.10	Gate	H=2.5m W=8m	unit	2	0	450,000	900	0	900
2.11	Warehouse	Domestic hazardous waste	unit	1	0	30,000,000	30,000	0	30,000
		Heavy machine	unit	1	0	45,000,000	45,000	0	45,000
2.12	Administrative facilities	Control office	unit	1	0	14,000,000	14,000	0	14,000
		Car wash equipment	unit	1	0	400,000	400	0	400
		Septic tank $10m^3$	unit	5	0	90,000	450	0	450
Sub Total							1,941,496	723,302	2,664,798
Overhead (Sub Total*25%(1/2product expense removes))							468,925	174,698	643,623
Total of Civil & Building							2,410,421	898,000	3,308,421
3. Equipment & Facility									0
3.1	Truck scale	Capacity 40t	unit	2	0	1,850,000	3,700	0	3,700
3.2	Pump Installing work	6.6kwh	unit	5	0	360,000	1,800	0	1,800
3.3	Piping work	φ100mm	m	2,107	0	5,650	11,905	0	11,905
Sub Total							17,405	0	17,405
Overhead (Sub Total*25%(1/2product expense removes))							2,174	0	2,174
Total of Equipment & Facility							19,579	0	19,579
Total of Construction							2,430,000	898,000	3,328,000
Engineering (10%)							243,000	89,800	332,800
Grand Total							2,673,000	987,800	3,660,800

(b) Juja

Table 1.1.5 Construction Cost (Option 2: Juja)

No.	Item / Work		Unit	Quantity		Unit Price	Amount Cost (x 1000 Ksh.)		
				1st phase	2nd phase	(Ksh)	1st phase	2nd phase	Total
1. Land Acquisition			m^2	358,880	0	300	108,000	0	108,000
2. Civil & Building									
2.1	Structure for solid waste retaining	Excavating(clay)	m^3	0	0	890	0	0	0
		Excavating(hard rock)	m^3	279,000	0	2,200	613,800	0	613,800
		Embankment	m^3	110,800	0	2,590	286,972	0	286,972
		Surplus soil filling	m^3	279,000	0	120	33,480	0	33,480
		Seed spraying	m^2	0	0	520	0	0	0
2.2	Leachate collection and darain	Drain pipe main	m	4,515	0	19,528	88,169	0	88,169
		Drain pipe branch	m	6,020	0	6,709	40,388	0	40,388
		Reservoir pit	unit	3	0	1,563,840	4,692	0	4,692
2.3	Leachate treatment pond	Excavating(clay)	m^3	0	0	890	0	0	0
		Excavating(hard rock)	m^3	97,900	0	2,200	215,380	0	215,380
		Surplus soil filling	m^3	97,900	0	120	11,748	0	11,748
		Liner laying	m^2	6,540	0	1,000	6,540	0	6,540
		Connection drainage	m	80	0	3,000	240	0	240
2.4	Gas exhaust equipment	Vertcal type PVC200mm	unit	101	0	8,696	878	0	878
		Side slope PVC200mm	m	0	0	3,480	0	0	0
2.5	Rainwater drainage	600-300×260	m	1,905	0	3,000	5,715	0	5,715
		900-600×260	m	0	0	4,000	0	0	0
		900-300×520	m	0	0	5,000	0	0	0
		1200-600×520	m	0	0	6,000	0	0	0
2.6	Access road	In site W=8m	m^2	12,040	0	3,950	47,558	0	47,558
		Out site Crashed stone W=8m	m^3	0	0	11,700	0	0	0
2.7	Onsite road	Crashed stone W=8m	m^3	800	0	11,700	9,360	0	9,360
2.8	Well for groundwater monitoring L=15m φ100mm		unit	2	0	625,500	1,251	0	1,251
2.9	Net fence	H=2.5m	m	1,905	0	12,000	22,860	0	22,860
2.10	Gate	H=2.5m W=8m	unit	1	0	450,000	450	0	450
2.11	Warehouse	Domestic hazardous waste	unit	1	0	30,000,000	30,000	0	30,000
		Heavy machine	unit	1	0	45,000,000	45,000	0	45,000
2.12	Administrative facilities	Control office	unit	1	0	14,000,000	14,000	0	14,000
		Car wash equipment	unit	1	0	400,000	400	0	400
		Septic tank $10m^3$	unit	5	0	90,000	450	0	450
Sub Total							1,479,331	0	1,479,331
Overhead (Sub Total*25%(1/2product expense removes))							345,509	0	345,509
Total of Civil & Building							1,824,840	0	1,824,840
3. Equipment & Facility									0
3.1	Truck scale	Capacity 40t	unit	2	0	1,850,000	3,700	0	3,700
3.2	Pump Installing work	6.6kwh	unit	5	0	360,000	1,800	0	1,800
3.3	Piping work	φ100mm	m	3,300	0	5,650	18,645	0	18,645
Sub Total							24,145	0	24,145
Overhead (Sub Total*25%(1/2product expense removes))							3,015	0	3,015
Total of Equipment & Facility							27,160	0	27,160
Total of Construction							1,852,000	0	1,852,000
Engineering (10%)							185,200	0	185,200
Grand Total							2,145,200	0	2,145,200

(3) Option 3 (Ruai + Mavoko)

Table 1.1.6 Total Construction Cost of Option 3 (1000KSh)

Item	Ruai	Mavoko	Total
Waste Amount (m^3)	8,490,000	4,180,000	12,670,000
Land Acquisition	0	79,000	79,000
Construction	3,328,000	2,257,000	5,585,000
Engineering Fee (Construction × 10%)	332,800	225,700	558,500
Total	**3,660,800**	**2,561,700**	**6,222,500**

(a) Ruai

Reference is made to **Table 1.1.4**.

(b) Mavoko

Table 1.1.7 Construction Cost (Option 3: Mavoko)

No.	Item / Work		Unit	Quantity		Unit Price	Amount Cost (x 1000 Ksh.)		
				1st phase	2nd phase	(Ksh)	1st phase	2nd phase	Total
1. Land Acquisition			m^2	263,000	0	300	79,000	0	79,000
2. Civil & Building									
2.1	Structure for solid waste retaining	Excavating(clay)	m^3	220,811	0	890	196,522	0	196,522
		Excavating(rock)	m^3	625,990	0	1,600	1,001,584	0	1,001,584
		Embankment	m^3	21,247	0	1,080	22,947	0	22,947
		Surplus soil filling	m^3	823,206	0	120	98,785	0	98,785
		Seed spraying	m^2	23,409	0	520	12,173	0	12,173
2.2	Leachate collection and darain	Drain pipe main	m	2,293	0	19,395	44,473	0	44,473
		Drain pipe branch	m	3,283	0	6,805	22,341	0	22,341
		Reservoir pit	unit	3	0	1,563,840	4,692	0	4,692
2.3	Leachate treatment pond	Excavating(clay)	m^3	26,528	0	890	23,610	0	23,610
		Excavating(rock)	m^3	26,528	0	1,600	42,445	0	42,445
		Surplus soil filling	m^3	53,056	0	120	6,367	0	6,367
		Liner laying	m^2	5,250	0	1,000	5,250	0	5,250
		Connection drainage	m	51	0	3,000	153	0	153
2.4	Gas exhaust equipment	Vertcal type PVC200mm	unit	65	0	8,696	565	0	565
		Side slope PVC200mm	m	15	0	3,480	52	0	52
2.5	Rainwater drainage	600-300×260	m	0	0	3,000	0	0	0
		900-600×260	m	486	0	4,000	1,944	0	1,944
		900-300×520	m	1,149	0	5,000	5,745	0	5,745
		1200-600×520	m	1,143	0	6,000	6,858	0	6,858
2.6	Access road	In site W=8m	m^2	20,803	0	3,950	82,172	0	82,172
		Out site Crashed stone W=8m	m^3	7,200	0	11,700	84,240	0	84,240
2.7	Onsite road	Crashed stone W=8m	m^3	1,804	0	11,700	21,107	0	21,107
2.8	Well for groundwater monitoring L=10m φ100mm		unit	2	0	521,000	1,042	0	1,042
2.9	Net fence	H=2.5m	m	2,224	0	12,000	26,688	0	26,688
2.10	Gate	H=2.5m W=8m	unit	2	0	450,000	900	0	900
2.11	Warehouse	Domestic hazardous waste	unit	1	0	30,000,000	30,000	0	30,000
		Heavy machine	unit	1	0	45,000,000	45,000	0	45,000
2.12	Administrative facilities	Control office	unit	1	0	14,000,000	14,000	0	14,000
		Car wash equipment	unit	1	0	400,000	400	0	400
		Septic tank $10m^3$	unit	5	0	90,000	450	0	450
Sub Total							1,802,505	0	1,802,505
Overhead (Sub Total*25%(1/2product expense removes))							435,353	0	435,353
Total of Civil & Building							2,237,858	0	2,237,858
3. Equipment & Facility									0
3.1	Truck scale	Capacity 40t	unit	2	0	1,850,000	3,700	0	3,700
3.2	Pump Installing work	6.6kwh	unit	5	0	360,000	1,800	0	1,800
3.3	Piping work	φ100mm	m	2,038	0	5,650	11,515	0	11,515
Sub Total							17,015	0	17,015
Overhead (Sub Total*25%(1/2product expense removes))							2,127	0	2,127
Total of Equipment & Facility							19,142	0	19,142
Total of Construction							2,257,000	0	2,257,000
Engineering (10%)							225,700	0	225,700
Grand Total							2,561,700	0	2,561,700

1.2 Construction Cost (Enclosure Dike)

(1) Option 1 (Ruai)

Table 1.2.1 Enclosure Dike Construction Cost (Option 1)

Item		Quantity (m^3)	Unit price (KSh)	Amount Cost* (1000KSh)
1st Phase	Block 1	147,550	2,590	477,690
	Block 2	141,050		456,650
	Block 3	135,850		439,810
	Block 4	124,800		404,040
2nd Phase	Block 1	91,650		296,720
	Block 2	90,350		292,510
	Block 3	89,050		288,300
	Block 4	80,600		260,940
Total		**900,900**		**2,916,660**

Note: *Amount cost includes overhead (25%).

(2) Option 2 (Ruai + Juja)

Table 1.2.2 Enclosure Dike Construction Cost (Option 2)

Item		Quantity (m^3)		Unit price (KSh)	Amount Cost* (1000KSh)		
		Ruai	Juja		Ruai	Juja	Total
1st Phase	Block 1	98,870	86,420	2,590	320,090	279,800	599,890
	Block 2	94,520	84,240		306,000	272,730	578,730
	Block 3	91,030	-		294,710	-	294,710
	Block 4	83,630	-		270,740	-	270,740
2nd Phase	Block 1	61,410	-		198,830	-	198,830
	Block 2	60,540	-		196,010	-	196,010
	Block 3	59,670	-		193,190	-	193,190
	Block 4	54,010	-		174,850	-	174,850
Total		**603,680**	**170,660**		**1,954,420**	**552,530**	**2,506,950**

Note: *Amount cost includes overhead (25%).

(3) Option 3 (Ruai + Mavoko)

Table 1.2.3 Enclosure Dike Construction Cost (Option 3)

Item		Quantity (m^3)		Unit price (KSh)	Amount Cost* (1000KSh)		
		Ruai	Mavoko		Ruai	Mavoko	Total
1st Phase	Block 1	98,870	92,100	2,590	320,090	298,170	618,260
	Block 2	94,520	88,000		306,000	284,900	590,900
	Block 3	91,030	84,800		294,710	274,540	569,250
	Block 4	83,630	77,900		270,740	252,200	522,940
2nd Phase	Block 1	61,410	-		198,830	-	198,830
	Block 2	60,540	-		196,010	-	196,010
	Block 3	59,670	-		193,190	-	193,190
	Block 4	54,010	-		174,850	-	174,850
Total		**603,680**	**342,800**		**1,954,420**	**1,109,810**	**3,064,230**

Note: *Amount cost includes overhead (25%).

1.3 Operation and Maintenance Cost

(1) Option 1 (Ruai)

(a) Total Waste Amount

Table 1.3.1 Landfill Site Capacity Requirement (Option 1)

Year	(1) West Amount (t/d)	(2) Waste Amount (m^3/d) (1)* 1.0 (Bulk density)	(3) Waste Amount (m^3/yera) (2)*365	(4) Cover Soil (m^3/year) (3) / 3	Total Waste Amount (m^3) (3)+(4)
2017	1,067	1,067.0	389,455	129,818	519,273
2018	1,159	1,159.0	423,035	141,012	1,083,320
2019	1,256	1,256.0	458,440	152,813	1,694,573
2020	1,353	1,353.0	493,845	164,615	2,353,033
2021	1,477	1,477.0	539,105	179,702	3,071,840
2022	1,610	1,610.0	587,650	195,883	3,855,373
2023	1,744	1,744.0	636,560	212,187	4,704,120
2024	1,887	1,887.0	688,755	229,585	5,622,460
2025	2,035	2,035.0	742,775	247,592	6,612,827
2026	2,177	2,177.0	794,605	264,868	7,672,300
2027	2,329	2,329.0	850,085	283,362	8,805,747
2028	2,481	2,481.0	905,565	301,855	10,013,167
2029	2,643	2,643.0	964,695	321,565	11,299,427
2030	2,815	2,815.0	1,027,475	342,492	**12,669,394**
Total			**9,502,045**	**3,167,349**	

Note: Bulk density (m^3/ t) = 1.0 m^3 / ton (see Section E of Volume 3, Supporting Report.)

(b) Cost of Heavy Machine Equipment

Table 1.3.2 Cost of Heavy Machine (Option 1)

Items	Unit Cost	2017-2020		2021-2025		2026-2030		Total	
		Number	Cost (2016)	Number	Cost (2021)	Number	Cost (2026)	Number	Cost
1. Bulldozer	13,000	7	91,000	3	39,000	4	52,000	14	182,000
2. Excavator	9,200	2	18,400	1	9,200	1	9,200	4	36,800
3. Caroller dump	9,300	3	27,900	1	9,300	1	9,300	5	46,500
4. Jeep	3,000	1	3,000	0	0	0	0	1	3,000
5. Total			**140,300**		**57,500**		**70,500**		**268,300**

Note: Cost shown in this table is thousand Kenya Shilling.

Bulldozer: Spread and Compaction (Capability: Waste 250m^3/day, Soil 500m^3/day)

2020 Waste: 1,353 (m^3/day) / 250 m^3 = 5.4

Soil : 451 (m^3/day) / 500 m^3 = 0.9

5.4 + 0.9 = 6.3 7 unit

2025 Waste: 2,035 (m^3/day) / 250 m^3 = 8.1

Soil : 678 (m^3/day) / 500 m^3 = 1.4

8.1 + 1.4 = 9.5 10 - 7 = 3 unit

2030 Waste: 2,815 (m^3/day) / 250 m^3 = 11.3

Soil : 938 (m^3/day) / 500 m^3 = 1.9

11.3 + 1.9 = 13.2 14 - 10 = 4 unit

Excavator: Soil excavation (Capability 310 m^3/ day)

2020 Soil : 451 (m^3/day) / 310 m^3 = 1.5 2unit

2025 Soil : 678 (m^3/day) / 310 m^3 = 2.2 3 - 2 = 1unit

2030 Soil : 938 (m^3/day) / 310 m^3 = 3.1 4 - 3 = 1unit

Crawler Dump: Soil Transportation (Capability 200m^3 / day, L=1km)

2020 Soil : 451 (m^3/day) / 200 m^3 = 2.3 3unit

2025 Soil : 678 (m^3/day) / 200 m^3 = 3.4 4 - 3 = 1unit

2030 Soil : 938 (m^3/day) / 200 m^3 = 4.7 5 - 4 = 1unit

(c) Engineering Cost

Table 1.3.3 Engineering Cost (Option 1)

Items	Monthly Fee (KSh)	2017-2020		2021-2025		2026-2030	
		Number	Cost (per/month)	Number	Cost (per /month)	Number	Cost (per /month)
Site Manager	39,000	1	39,000	1	39,000	1	39,000
Secretary	17,550	1	17,550	1	17,550	1	17,550
Chief of engineering section	27,300	1	27,300	1	27,300	1	27,300
Weighing Bridge engineer	19,500	3	58,500	3	58,500	3	58,500
Site Inspector	19,500	3	58,500	3	58,500	3	58,500
Chief Operator	19,500	1	19,500	1	19,500	1	19,500
Operator	17,550	19	333,450	27	473,850	37	649,350
Security Guard	17,550	2	35,100	2	35,100	2	35,100
Total		31	588,900	39	729,300	49	904,800

(d) Machinery Fuel and Maintenance

Heavy Machine Fuel

Bulldozer 18L / hour, 8hour / day, 75KSh / L

2020 7 unit x 18L x 8hour x 75KSh x 365day = 27,594,000KSh / year

2025 10 unit x 18L x 8hour x 75KSh x 365day = 39,420,000KSh / year

2030 14 unit x 18L x 8hour x 75KSh x 365day = 55,188,000KSh / year

Excavator 18L / hour, 8hour / day, 75KSh / L

2020 2 unit x 18L x 8hour x 75KSh x 365day = 7,884,000KSh / year

2025 3 unit x 18L x 8hour x 75KSh x 365day = 11,826,000KSh / year

2030 4 unit x 18L x 8hour x 75KSh x 365day = 15,768,000KSh / year

Crawler Dump 14.4L / hour, 8hour / day, 75KSh / L

2020 3 unit x 14.4L x 8hour x 75KSh x 365day = 9,462,000KSh / year

2025 4 unit x 14.4L x 8hour x 75KSh x 365day = 12,616,000KSh / year

2030 5 unit x 14.4L x 8hour x 75KSh x 365day = 15,770,000KSh / year

Jeep 2L / day, 75KSh / L

1 unit x 2L x 75KSh x 365day = 55,000KSh / year

Heavy Machine Maintenance

Bulldozer 12,300,000KSh x 0.6 / 10 = 738,000KSh / year / unit

2020 7 unit x 738,000KSh = 5,166,000KSh / year

2025 10 unit x 738,000KSh = 7,380,000KSh / year

2030 14 unit x 738,000KSh = 10,332,000KSh / year

Excavator 8,600,000KSh x 0.45 / 8.5 = 455,000KSh / year / unit

2020 2 unit x 455,000KSh = 910,000KSh / year

2025 3 unit x 455,000KSh = 1,365,000KSh / year

2030 4 unit x 455,000KSh = 1,820,000KSh / year

Crawler Dump 8,500,000KSh x 0.65 / 8.5 = 650,000KSh / year / unit

2020 3 unit x 650,000KSh = 1,950,000KSh / year

2025 4 unit x 650,000KSh = 2,600,000KSh / year

2030 5 unit x 650,000KSh = 3,250,000KSh / year

Jeep 3,000,000KSh x 0.05 = 150,000KSh / year

Truck Scale Maintenance

3,000,000KSh / year

(e) Electricity

Office 3kWh x 8hours x 14KSh / kWh x 365day = 122,640KSh / year

Site (pump) 6.6kWh x 22hours x 14KSh / kWh x 365day = 742,045KSh/ year

(Track scale) 0.08kWh x 8hours x 14KSh / kWh x 365day = 6,570KSh/ year

Total 122,640 + 742,045 + 6,570 = 871,000KSh / year

(f) Water

Office 200L / day / person 100KSh / m^3

2017-2020 31 x 200L x 100KSh / m^3 x 365day / 1000 = 226,000KSh / year

2021-2025 39 x 200L x 100KSh / m^3 x 365day / 1000 = 285,000KSh / year

2026-2030 49 x 200L x 100KSh / m^3 x 365day / 1000 = 358,000KSh / year

Site (car wash) 30L / unit 100KSh / m^3

2017-2020 225unit x 30L x 100KSh / m^3 x 365day / 1000 = 246,000KSh/ year

2021-2025 324unit x 30L x 100KSh / m^3 x 365day / 1000 = 355,000KSh/ year

2026-2030 450unit x 30L x 100KSh / m^3 x 365day / 1000 = 493,000KSh/ year

Total 2017-2020 226,000 + 246,000 = 472,000KSh / year

2021-2025 285,000 + 355,000 = 640,000KSh / year

2026-2030 358,000 + 493,000 = 851,000KSh / year

(g) Environmental Monitoring

Treated leachate quality

Inspection Items : pH, BOD, COD, SS, HN_4^+, TDS, E.coli, Total coliforms

Frequency : 1 / month

Sample point : 1

Unit cost : -cost per sample 6,300KSh / unit
-professional fees & reimbursable cost 102,500KSh / unit

Annual cost (per year):

(6,300 + 102,500) x 12 x 1 = 1,305,600KSh / year

Groundwater quality

Inspection Items : pH, BOD, COD, SS, HN4+, TDS, E.coli, Total coliforms

Frequency : 2 / year

Sample point : 2

Unit cost : -cost per sample 6,300KSh / unit

(-professional fees & reimbursable cost 102,500KSh / unit)

Annual cost (per year):

6,300 x 2 x 2 = 25,200KSh / year

Leachate quality

Inspection Items : pH, BOD, COD, SS, HN4+, TDS, E.coli, Total coliforms

Frequency : 4 / year

Sample point : 1

Unit cost : -cost per sample 6,300KSh / unit

(-professional fees & reimbursable cost 102,500KSh / unit)

Annual cost (per year):

6,300 x 4 x 1 = 25,200KSh / year

Landfill Gas

Inspection Items : CH_4, CO_2, O_2, CO, H_2S Temperature

Frequency : 4 / year

Purchase cost of portable instrument: 820,000KSh (2017, 2026)

Maintenance cost : 82,000KSh / year

Total

Table 1.3.4 Annual Environmental Monitoring Expenditures (Option 1)

Year	Treated Leachate	Groundwater	Leachate	Landfill Gas	Total (KSh)
2017	1,305,600	25,200	25,200	820,000	2,176,000
2018	1,305,600	25,200	25,200	82,000	1,438,000
2019	1,305,600	25,200	25,200	82,000	1,438,000
2020	1,305,600	25,200	25,200	82,000	1,438,000
2021	1,305,600	25,200	25,200	82,000	1,438,000
2022	1,305,600	25,200	25,200	82,000	1,438,000
2023	1,305,600	25,200	25,200	82,000	1,438,000
2024	1,305,600	25,200	25,200	82,000	1,438,000
2025	1,305,600	25,200	25,200	82,000	1,438,000
2026	1,305,600	25,200	25,200	820,000	2,176,000
2027	1,305,600	25,200	25,200	82,000	1,438,000
2028	1,305,600	25,200	25,200	82,000	1,438,000
2029	1,305,600	25,200	25,200	82,000	1,438,000
2030	1,305,600	25,200	25,200	82,000	1,438,000
Total	18,278,400	352,800	352,800	2,624,000	21,608,000

(h) Cover Soil

Construction surplus soil (m^3): 1,960,000m^3

Unusable soil: 1,960,000 x 10% = 196,000m^3

Soil for cover soil: 1,960,000 - 196,000 = 1,764,000m^3

Table 1.3.5 Annual Cover Soil Expenditures (Option 1)

Year	Cover Soil (m^3/year)	Total Cover Soil Amount (m^3)	Construction Surplus Soil (m^3)	Insufficiency (m^3)	Unit Cost (KSh)	Total Amount (1000KSh)
2017	129,818	129,818	1,764,000	0	1,060	0
2018	141,012	270,830		0		0
2019	152,813	423,643		0		0
2020	164,615	588,258		0		0
2021	179,702	767,960		0		0
2022	195,883	963,843		0		0
2023	212,187	1,176,030		0		0
2024	229,585	1,405,615		0		0
2025	247,592	1,653,207		0		0
2026	264,868	1,918,075		154,075		163,320
2027	283,362	2,201,437		283,362		300,360
2028	301,855	2,503,292		301,855		319,970
2029	321,565	2,824,857		321,565		340,860
2030	342,492	3,167,349		342,492		363,040
Total	3,167,349			1,249,274		1,324,230

(i) Road Maintenance

Length : 500m / year

Width : 8m

Thickness : 0.4m

Unit cost : 1,940KSh / m^2 / 0.4m

Annual cost : 500 x 8 x 1,940 = 9,700,000 KSh / year

(j) Expand of Gas Exhaust pipe

All additional length: 23m / unit

Unit: 195

Unit cost: 4,870KSh

Total cost: 23 x 195 x 4,870 = 21,841,950KSh

Annual cost: 21,841,950 / 14 year = 1,560,000KSh

(k) Total Operation & Maintenance Cost

Table 1.3.6 Annual O & M Expenditures (Option 1)

Year	c	d	e	f	g	h	i	j	Total
2017	7,067	45,004	871	472	2,176	0	9,700	1,560	66,850
2018	7,067	48,722	871	472	1,438	0	9,700	1,560	69,830
2019	7,067	52,452	871	472	1,438	0	9,700	1,560	73,560
2020	7,067	56,172	871	472	1,438	0	9,700	1,560	77,280
2021	8,752	60,619	871	640	1,438	0	9,700	1,560	83,580
2022	8,752	65,069	871	640	1,438	0	9,700	1,560	88,030
2023	8,752	69,519	871	640	1,438	0	9,700	1,560	92,480
2024	8,752	73,959	871	640	1,438	0	9,700	1,560	96,920
2025	8,752	78,409	871	640	1,438	0	9,700	1,560	101,370
2026	10,858	83,794	871	851	2,176	163,320	9,700	1,560	109,810
2027	10,858	89,182	871	851	1,438	300,360	9,700	1,560	414,820
2028	10,858	94,562	871	851	1,438	319,970	9,700	1,560	439,810
2029	10,858	99,952	871	851	1,438	340,860	9,700	1,560	466,090
2030	10,858	105,332	871	851	1,438	363,040	9,700	1,560	493,650
Total	126,318	1,022,747	12,194	9,343	21,608	1,324,230	135,800	21,840	2,674,080

Note: Cost shown in this table is thousand Kenya Shilling.

(2) Option 2 and 3 (Ruai + Juja Ruai + Mavoko)

(a) Total Waste Amount

Table 1.3.7 Landfill Site Capacity Requirement (Option 2 and 3)

Year	(1) West Amount (t/d)		(2) Waste Amount (m^3/d) (1)* 1.0 (Bulk density)		(3) Waste Amount (m^3/yera) (2)*365		(4) Cover Soil (m^3/year) (3) / 3		Total Waste Amount (m^3) (3)+(4)	
	Ruai	Juja Mavoko	Ruai	Juja Mavoko	Ruai	Juja Mavoko	Ruai	Juja Mavoko	Ruai	Juja Mavoko
2017	715	352	715.0	352.0	260,975	128,480	86,992	42,827	347,967	171,307
2018	776	383	776.0	383.0	283,240	139,795	94,413	46,598	725,620	357,700
2019	841	415	841.0	415.0	306,965	151,475	102,322	50,492	1,134,907	559,667
2020	905	448	905.0	448.0	330,325	163,520	110,108	54,507	1,575,340	777,694
2021	989	489	989.0	489.0	360,985	178,485	120,328	59,495	2,056,653	1,015,674
2022	1,077	532	1,077.0	532.0	393,105	194,180	131,035	64,727	2,580,793	1,274,581
2023	1,167	577	1,167.0	577.0	425,955	210,605	141,985	70,202	3,148,733	1,555,388
2024	1,263	624	1,263.0	624.0	460,995	227,760	153,665	75,920	3,763,393	1,859,068
2025	1,362	673	1,362.0	673.0	497,130	245,645	165,710	81,882	4,426,233	2,186,595
2026	1,458	719	1,458.0	719.0	532,170	262,435	177,390	87,478	5,135,793	2,536,508
2027	1,561	768	1,561.0	768.0	569,765	280,320	189,922	93,440	5,895,480	2,910,268
2028	1,664	817	1,664.0	817.0	607,360	298,205	202,453	99,402	6,705,293	3,307,875
2029	1,774	869	1,774.0	869.0	647,510	317,185	215,837	105,728	7,568,640	3,730,788
2030	1,890	924	1,890.0	924.0	689,850	337,260	229,950	112,420	**8,488,440**	**4,180,468**
Total					6,366,330	3,135,350	2,122,110	1,045,118		12,668,908

Note: Bulk density (m^3/ t) = 1.0 m^3 / ton (see Section E of Volume 3, Supporting Report.)

(b) Heavy Machine Equipment Cost

Table 1.3.8 List of Heavy Machine (Option 2 and 3)

Items	Unit Cost	2017-2020		2021-2025		2026-2030		Total	
		Number	Cost (2016)	Number	Cost (2021)	Number	Cost (2026)	Number	Cost
1. Bulldozer	13,000	8	104,000	3	39,000	3	39,000	14	182,000
2. Excavator	9,200	2	18,400	1	9,200	1	9,200	3	36,800
3.Carollerdump	9,300	3	27,900	2	18,600	1	9,300	3	55,800
4. Jeep	3,000	2	6,000	0	0	0	0	2	6,000
5. Total			156,300		66,800		57,500		280,600

Note: Cost shown in this table is thousand Kenya Shilling.

Bulldozer: Spread and Compaction (Capability Waste 250m^3/day Soil 500m^3/day)

2020 Waste: Ruai 905 (m^3/day) / 250 m^3 = 3.6

Juja or Mavoko 448 (m^3/day) / 250 m^3 = 1.8

Soil : Ruai 302 (m^3/day) / 500 m^3 = 0.6

Juja or Mavoko 149 (m^3/day) / 500 m^3 = 0.3

Ruai 3.6 + 0.6 = 4.2 5 unit

Juja or Mavoko 1.8 + 0.3 = 2.1 3 unit Total 8 unit

2025 Waste: Ruai 1,362 (m^3/day) / 250 m^3 = 5.4

Juja or Mavoko 673 (m^3/day) / 250 m^3 = 2.7

Soil : Ruai 272 (m^3/day) / 500 m^3 = 0.9

Juja or Mavoko 224 (m^3/day) / 500 m^3 = 0.4

Ruai 5.4 + 0.9 = 6.3 7 - 5 = 2 unit

Juja or Mavoko 2.7 + 0.4 = 3.1 4 - 3 = 1 unit Total 11 unit

2030 Waste: Ruai 1,890 (m^3/day) / 250 m^3 = 7.6

Juja or Mavoko 924 (m^3/day) / 250 m^3 = 3.7

Soil : Ruai 630 (m^3/day) / 500 m^3 = 1.3

Juja or Mavoko 308 (m^3/day) / 500 m^3 = 0.6

Ruai 7.6 + 1.3 = 8.9 9 - 7 = 2 unit

Juja or Mavoko 3.7 + 0.6 = 4.3 5 - 4= 1 unit Total 14 unit

Excavator: Soil excavation (Capability 310 m^3/ day)

2020 Soil : Ruai 302 (m^3/day) / 310 m^3 = 1.0 1unit

Juja or Mavoko 149 (m^3/day) / 310 m^3 = 0.5 1unit Total 2 unit

2025 Soil : Ruai 454 (m^3/day) / 310 m^3 = 1.5 2 - 1 = 1unit

Juja or Mavoko 224 (m^3/day) / 310 m^3 = 0.7 1 - 1 = 0 unit Total 3 unit

2030 Soil : Ruai 630 (m^3/day) / 310 m^3 = 2.1 3 - 2 = 1unit

Juja or Mavoko 308 (m^3/day) / 310 m^3 = 1.0 1 - 1 = 0 unit Total 4 unit

Crawler Dump: Soil Transportation (Capability 200m^3 / day, L=1km)

2020 Soil : Ruai 302 (m^3/day) / 200 m^3 = 1.5 2unit

Juja or Mavoko 149 (m^3/day) / 200 m^3 = 0.7 1unit Total 3 unit

2025 Soil : Ruai 454 (m^3/day) / 200 m^3 = 2.3 3 - 2 = 1unit

Juja or Mavoko 224 (m^3/day) / 200 m^3 = 1.1 2 - 1 = 1 unit Total 5 unit

2030 Soil : Ruai630 (m^3/day) / 200 m^3 = 3.2 4 - 3 = 1unit

Juja or Mavoko 308 (m^3/day) / 200 m^3 = 1.5 2 - 2 = 0 unit Total 6 unit

(c) Engineering Cost

Table 1.3.9 Engineering Cost (Option 2 and 3)

Items		2017-2020		2021-2025		2026-2030	
	Monthly Fee (KSh)	Number	Cost (per/month)	Number	Cost (per/month)	Number	Cost (per/month)
Site Manager	39,000	1	39,000	1	39,000	1	39,000
Secretary	17,550	1	17,550	1	17,550	1	17,550
Chief of engineering section	27,300	2	54,600	2	54,600	2	54,600
Weighing Bridge engineer	19,500	6	117,000	6	117,000	6	117,000
Site Inspector	19,500	6	117,000	6	117,000	6	117,000
Chief Operator	19,500	2	39,000	2	39,000	2	39,000
Operator	17,550	21	368,550	30	526,500	38	666,900
Security Guard	17,550	4	70,200	4	70,200	4	70,200
Total		43	822,900	52	980,850	60	1,121,250

(d) Machinery Fuel and Maintenance

Heavy Machine Fuel

Bulldozer 18L / hour, 8hour / day, 75KSh / L

2020 8 unit x 18L x 8hour x 75KSh x 365day = 31,536,000KSh / year

2025 11 unit x 18L x 8hour x 75KSh x 365day = 43,362,000KSh / year

2030 14 unit x 18L x 8hour x 75KSh x 365day = 55,188,000KSh / year

Excavator 18L / hour, 8hour / day, 75KSh / L

2020 2 unit x 18L x 8hour x 75KSh x 365day = 7,884,000KSh / year

2025 3 unit x 18L x 8hour x 75KSh x 365day = 11,826,000KSh / year

2030 4 unit x 18L x 8hour x 75KSh x 365day = 15,768,000KSh / year

Crawler Dump 14.4L / hour, 8hour / day, 75KSh / L

2020 3 unit x 14.4L x 8hour x 75KSh x 365day = 9,460,800KSh / year

2025 5 unit x 14.4L x 8hour x 75KSh x 365day = 15,768,000KSh / year

2030 6 unit x 14.4L x 8hour x 75KSh x 365day = 18,921,600KSh / year

Jeep 2L / day, 75KSh / L

2 unit x 2L x 75KSh x 365day = 110,000KSh / year

Heavy Machine Maintenance

Bulldozer 12,300,000KSh x 0.6 / 10 = 738,000KSh / year/ unit

2020 8 unit x 738,000KSh = 5,904,000KSh / year

2025 11 unit x 738,000KSh = 8,118,000KSh / year

2030 14 unit x 738,000KSh = 10,332,000KSh / year

Excavator 8,600,000KSh x 0.45 / 8.5 = 455,000KSh / year/ unit

2020 2 unit x 455,000KSh = 910,000KSh / year

2025 3 unit x 455,000KSh = 1,365,000KSh / year

2030 4 unit x 455,000KSh = 1,820,000KSh / year

Crawler Dump 8,500,000KSh x 0.65 / 8.5 = 650,000KSh / year / unit

2020 3 unit x 650,000KSh = 1,950,000KSh / year

2025 5 unit x 650,000KSh = 3,250,000KSh / year

2030 6 unit x 650,000KSh = 3,900,000KSh / year

Jeep 3,000,000KSh x 2 x 0.05 = 300,000KSh / year

Truck Scale Maintenance

3,000,000KSh / year

(e) Electricity

Office 3kWh x 8hours x 14KSh / kWh x 365day x 2 = 245,280KSh / year

Site (pump) 6.6kWh x 22hours x 14KSh / kWh x 365day x 1.5= 1,112,885KSh/ year

(Track scale) 0.08kWh x 8hours x 14KSh / kWh x 365day x 2 = 13,140KSh/ year

Total 245,280 + 1,112,885 + 13,140 = 1,371,000KSh / year

(f) Water

Office 200L / day / person 100KSh / m^3

2017-2020 43 x 200L x 100KSh / m^3 x 365day / 1000 = 314,000KSh / year

2021-2025 52 x 200L x 100KSh / m^3 x 365day / 1000 = 380,000KSh / year

2026-2030 60 x 200L x 100KSh / m^3 x 365day / 1000 = 438,000KSh / year

Site (car wash) 30L / unit 100KSh / m^3

2017-2020 225unit x 30L x 100KSh / m^3 x 365day / 1000 = 246,000KSh/ year

2021-2025 324unit x 30L x 100KSh / m^3 x 365day / 1000 = 355,000KSh/ year

2026-2030 450unit x 30L x 100KSh / m^3 x 365day / 1000 = 493,000KSh/ year

Total 2017-2020 314,000 + 246,000 = 560,000KSh / year

2021-2025 380,000 + 355,000 = 735,000KSh / year

2026-2030 438,000 + 493,000 = 931,000KSh / year

(g) Environmental Monitoring

Treated leachate quality

Inspection Items : pH, BOD, COD, SS, HN_4^+, TDS, E.coli, Total coliforms

Frequency : 1 / month

Sample point : 1 x 2

Unit cost : -cost per sample 6,300KSh / unit

-professional fees & reimbursable cost 102,500KSh / unit

Annual cost (per year):

(6,300 + 102,500) x 12 x 2 = 2,611,200KSh / year

Groundwater quality

Inspection Items : pH, BOD, COD, SS, HN4+, TDS, E.coli, Total coliforms

Frequency : 2 / year

Sample point : 2 x 2

Unit cost : -cost per sample 6,300KSh / unit

(-professional fees & reimbursable cost 102,500KSh / unit)

Annual cost (per year):

6,300 x 2 x 4 = 50,400KSh / year

Leachate quality

Inspection Items : pH, BOD, COD, SS, HN4+, TDS, E.coli, Total coliforms

Frequency : 4 / year

Sample point : 1 x 2

Unit cost : -cost per sample 6,300KSh / unit

(-professional fees & reimbursable cost 102,500KSh / unit)

Annual cost (per year):

6,300 x 4 x 2 = 50,400KSh / year

Landfill Gas

Inspection Items : CH_4, CO_2, O_2, CO, H_2S Temperature

Frequency : 4 / year

Purchase cost of portable instrument: 820,000 x 2 = 1,640,000KSh (2017, 2026)

Maintenance cost : 82,000 x 2 = 164,000KSh / year

Total

Table 1.3.10 Annual Environmental Monitoring Expenditures (Option 2 and 3)

Year	Treated Leachate	Groundwater	Leachate	Landfill Gas	Total (KSh)
2017	2,611,200	50,400	50,400	1,640,000	4,352,000
2018	2,611,200	50,400	50,400	164,000	2,876,000
2019	2,611,200	50,400	50,400	164,000	2,876,000
2020	2,611,200	50,400	50,400	164,000	2,876,000
2021	2,611,200	50,400	50,400	164,000	2,876,000
2022	2,611,200	50,400	50,400	164,000	2,876,000
2023	2,611,200	50,400	50,400	164,000	2,876,000
2024	2,611,200	50,400	50,400	164,000	2,876,000
2025	2,611,200	50,400	50,400	164,000	2,876,000
2026	2,611,200	50,400	50,400	1,640,000	4,352,000
2027	2,611,200	50,400	50,400	164,000	2,876,000
2028	2,611,200	50,400	50,400	164,000	2,876,000
2029	2,611,200	50,400	50,400	164,000	2,876,000
2030	2,611,200	50,400	50,400	164,000	2,876,000
Total	36,556,800	705,600	705,600	5,248,000	43,216,000

(h) Cover Soil

Construction surplus soil (m^3): Ruai 1,310,000m^3

Juja 279,000m^3

Mavoko 650,000m^3

Unusable soil: Ruai 1,310,000 x 10% = 131,000m^3

Juja 279,000 x 10% = 28,000m^3

Mavoko 650,000 x 10% =65,000m^3

Soil for cover soil: Ruai 1,310,000 - 131,000 = 1,179,000m^3

Juja 279,000 - 28,000 = 251,000m^3

Mavoko 650,000 - 65,000 = 585,000m^3

Table 1.3.11 Annual Cover Soil Expenditures (Option 2)

Year	Cover Soil (m^3/year)		Total Cover Soil Amount (m^3)		Const-ruction Surplus Soil (m^3)	Insufficiency (m^3)		Unit Cost (KSh)	Total Amount (1000KSh)		
	Ruai	Juja	Ruai	Juja		Ruai	Juja		Ruai	Juja	Total
2017	86,992	42,827	86,992	42,827	Ruai 1,179,000	0	0	1,060	0	0	0
2018	94,413	46,598	181,405	89,425		0	0		0	0	0
2019	102,322	50,492	283,727	139,917		0	0		0	0	0
2020	110,108	54,507	393,835	194,424	Juja 251,000	0	0		0	0	0
2021	120,328	59,495	514,163	253,919		0	2,919		0	3,094	3,094
2022	131,035	64,727	645,198	318,646		0	64,727		0	68,610	68,610
2023	141,985	70,202	787,183	388,848		0	70,202		0	74,410	74,410
2024	153,665	75,920	940,848	464,768		0	75,920		0	80,480	80,480
2025	165,710	81,882	1,106,558	546,650		0	81,882		0	86,790	86,790
2026	177,390	87,478	1,283,948	634,128		104,948	87,478		111,245	92,730	203,975
2027	189,922	93,440	1,473,870	727,568		189,922	93,440		201,320	99,050	300,370
2028	202,453	99,402	1,676,323	826,970		202,453	99,402		214,600	105,370	319,970
2029	215,837	105,728	1,892,160	932,698		215,837	105,728		228,790	112,070	340,860
2030	229,950	112,420	2,122,110	1,045,118		229,950	112,420		243,750	119,170	362,920
Total	2,122,110	1,045,118				838,162	791,199		888,460	838,680	1,727,140

Table 1.3.12 Annual Cover Soil Expenditures (Option 3)

Year	Cover Soil (m^3/year)		Total Cover Soil Amount (m^3)		Const-ruction Surplus Soil (m^3)	Insufficiency (m^3)		Unit Cost (KSh)	Total Amount (1000KSh)		
	Ruai	Mavoko	Ruai	Mavoko		Ruai	Mavoko		Ruai	Mavoko	Total
2017	86,992	42,827	86,992	42,827	Ruai 1,179,000	0	0	1,060	0	0	0
2018	94,413	46,598	181,405	89,425		0	0		0	0	0
2019	102,322	50,492	283,727	139,917		0	0		0	0	0
2020	110,108	54,507	393,835	194,424	Mavoko 585,000	0	0		0	0	0
2021	120,328	59,495	514,163	253,919		0	0		0	0	0
2022	131,035	64,727	645,198	318,646		0	0		0	0	0
2023	141,985	70,202	787,183	388,848		0	0		0	0	0
2024	153,665	75,920	940,848	464,768		0	0		0	0	0
2025	165,710	81,882	1,106,558	546,650		0	0		0	0	0
2026	177,390	87,478	1,283,948	634,128		104,948	49,128		111,245	52,076	163,321
2027	189,922	93,440	1,473,870	727,568		189,922	93,440		201,320	99,050	300,370
2028	202,453	99,402	1,676,323	826,970		202,453	99,402		214,600	105,370	319,970
2029	215,837	105,728	1,892,160	932,698		215,837	105,728		228,790	112,070	340,860
2030	229,950	112,420	2,122,110	1,045,118		229,950	112,420		243,750	119,170	362,920
Total	2,122,110	1,045,118				838,162	410,990		888,460	435,660	1,324,120

(i) Road Maintenance

Length : 500m / year

Width : 8m

Thickness : 0.4m

Unit cost : 1,940KSh / m^2 / 0.4m

Annual cost : 500 x 8 x 1,940 = 9,700,000 KSh / year

(j) Expand of Gas Exhaust pipe

All additional length: 23m / unit

Unit: 195

Unit cost: 4,870KSh

Total cost: 23 x 195 x 4,870 = 21,841,950KSh

Annual cost: 21,841,950 / 14 year = 1,560,000KSh

(k) Total Operation & Maintenance Cost

Table 1.3.13 Annual O & M Expenditures (Option 2 and 3)

Year	c	d	e	f	g	h		i	j	Total	
						Option2	Option3			Option2	Option3
2017	9,875	48,862	1,371	560	4,352	0	0	9,700	1,560	76,280	76,280
2018	9,875	52,928	1,371	560	2,876	0	0	9,700	1,560	78,870	78,870
2019	9,875	56,988	1,371	560	2,876	0	0	9,700	1,560	82,930	82,930
2020	9,875	61,058	1,371	560	2,876	0	0	9,700	1,560	87,000	87,000
2021	11,770	66,268	1,371	735	2,876	2,919	0	9,700	1,560	94,280	94,280
2022	11,770	71,478	1,371	735	2,876	68,610	0	9,700	1,560	168,100	99,490
2023	11,770	76,688	1,371	735	2,876	74,410	0	9,700	1,560	179,110	104,700
2024	11,770	81,888	1,371	735	2,876	80,480	0	9,700	1,560	190,380	109,900
2025	11,770	87,098	1,371	735	2,876	86,790	0	9,700	1,560	201,900	115,110
2026	13,455	91,551	1,371	931	4,352	203,975	163,321	9,700	1,560	215,650	122,920
2027	13,455	95,997	1,371	931	2,876	300,370	300,370	9,700	1,560	426,260	426,260
2028	13,455	100,447	1,371	931	2,876	319,970	319,970	9,700	1,560	450,310	450,310
2029	13,455	104,897	1,371	931	2,876	340,860	340,860	9,700	1,560	475,650	475,650
2030	13,455	109,347	1,371	931	2,876	362,920	362,920	9,700	1,560	502,160	502,160
Total	165,625	1,105,495	19,194	10,570	43,216	1,727,140	1,324,120	135,800	21,840	3,228,880	2,825,860

Note: Cost shown in this table is thousand Kenya Shilling.

2. Cost Estimation of Closure and O&M of Dandora Dumpsite

2.1 Cost of Urgent Improvement Work

Table 2.1.1 Cost Estimation of Urgent Improvement Work

Year	Onsite Road*	Cover Soil			Total
		Soil Amount (m^3)	Unit Cost (KSh/m^3)	Sub Total Cost (KSh)	
2011	50,000,000	25,200	1,060	26,712,000	76,712,000
2012	50,000,000	27,100		28,726,000	78,726,000
2013	50,000,000	29,100		30,846,000	80,846,000
2014	50,000,000	31,100		32,966,000	82,966,000
2015		33,300		35,298,000	35,298,000
2016		35,700		37,842,000	37,842,000
Total		**181,500**			**392,390,000**

Source: *Department of Environment and City Council of Nairobi

2.2 Operation and Maintenance Cost (2011-2016)

Table 2.2.1 Cost Estimation of Operation and Maintenance

Year	Total salary	Machine maintenance fee & fuel	Heavy machine Hiring fee	Total
2011	3,100,000	10,000,000	20,000,000	33,100,000
2012	3,100,000	10,000,000	30,000,000	43,100,000
2013	3,100,000	10,000,000	30,000,000	43,100,000
2014	3,100,000	10,000,000	30,000,000	43,100,000
2015	3,100,000	10,000,000	30,000,000	43,100,000
2016	3,100,000	10,000,000	30,000,000	43,100,000

Source: *Department of Environment and City Council of Nairobi