



# Japanese Technical Cooperation Project for Promotion of Regional Initiative on Solid Waste Management in Pacific Island Countries (J-PRISM)

## Aerobic and Evaporation Method of Landfill Improvement Case Study of Vunato Disposal Site (VDS) Lautoka City Council



Presented by:

Shalend Prem Singh  
Lautoka City Council

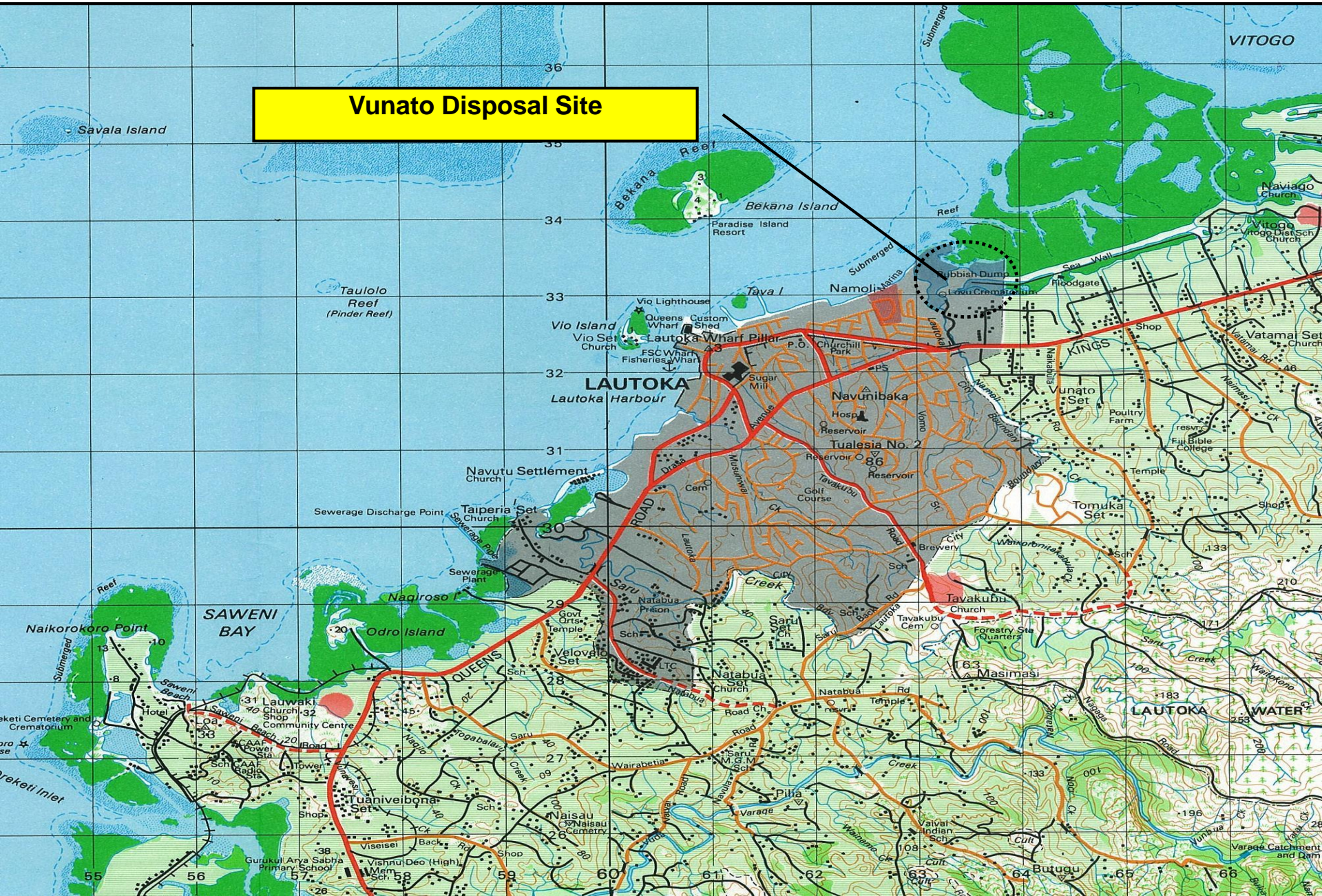
[shalendsingh75@yahoo.com](mailto:shalendsingh75@yahoo.com)

## 1. Major Features of VDS Before/After Rehabilitation

Before	After
Open dumping in ad hoc basis	Controlled systematic landfilling under Aerobic and Evaporation System
Uncontrolled scavenging	Controlled with permit/OSH compliance
Regular dump fires and complaints	Reduced significantly
No Proper Access and Drainage	100% improved. Special waste disposal area
Only two staffs	7staffs and 24 hours security
Old machinery and lack of maintenance	Excavator, D6, wood chipper, MPT, weighbridge, brush cutters etc
No form of recycling	Market composting/waste pickers recycling
Improper facilities	Air conditioned office, wash room etc
Lack of data management and reporting	Proper data management and reporting
Unsustainable financing	Tipping fee using weighbridge system
No demarcation of area	Proper surveyed boundary clearly defined
Fewer dump visits	No. of visits increased dramatically



# Location of Vunato Disposal Site from Lautoka City





## 2. Situation of VDS Prior to Improvement





Enclosing bank

Periphery bank with drain	
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**Access road**

Periphery bank with out drain
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Compost yard



**Compost yard**

Administration facility

Section 2

Section 3

Section 4

Special  
section

Section 5

Section 6

Recycling yard

Buffer zone

### Concept of Aerobic-Evaporation Lautoka Disposal system

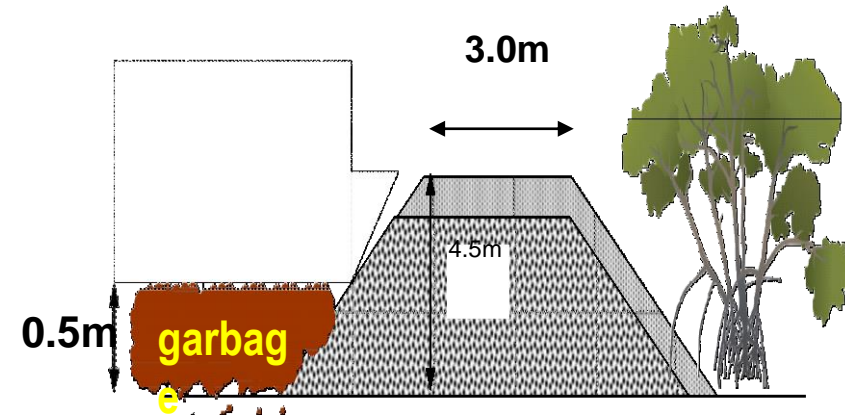
## 4. Basic Measures for Improvements

1. Strengthening management system
  - ☐ Define boundary of the disposal site
  - ☐ Established a data management system by introduction of weighbridge
  - ☐ Levy fair tipping fee according to waste category and origin of waste.
  - ☐ Prepared landfill plan
2. Minimization of environment impact to the surroundings
  - ☐ Constructed buffer zone, enclosing banks (cells).
  - ☐ Constructed special waste area
  - ☐ Established an environmental monitoring system (Environmental Management Plan)
3. Establishment of landfill operation system
  - ☐ ***Adopt Aerobic and Evaporation operation (thickness=50cm)***
  - ☐ Man power reinforcements (10 staffs) including security.
  - ☐ Control of waste pickers (permit ).
  - ☐ Prepared access road and drainage.
  - ☐ Maintained the creeks and surrounding.
  - ☐ Regular fly Spraying.
  - ☐ Servicing and maintenance of plants/equipment
  - ☐ Composting, recycling and green waste chipping

## 5. Adopted Aerobic and Evaporation Method of Land filling

### Features

- Spread waste upto height of 0.5 m across cell. Leave to rehabilitate
- Move operation to next cell
- Return to same cell once disposal is completed in other 5 cells ( 8 – 10 months)





# Advantages/Disadvantages of Aerobic and Evaporation Landfilling Method

## Advantages

- Overall - Cost effective
- Less technical - Easy to manage.
- Effective in eliminating moisture from waste pile (reduced leachate generation).
- Recyclables can be easily recovered by waste pickers.
- Low maintenance cost.
- Decomposition under aerobic condition
- Less foul odor

## Disadvantages

- Unsightly
- Waste scattering due to no soil covering.
- Fly nuisance
- Risk of fire outbreak
- No leachate treatment facility – leachate might seep to underground water table esp. during rainy weather.
- Bigger working phase



# Sample Report for Month of February 2016

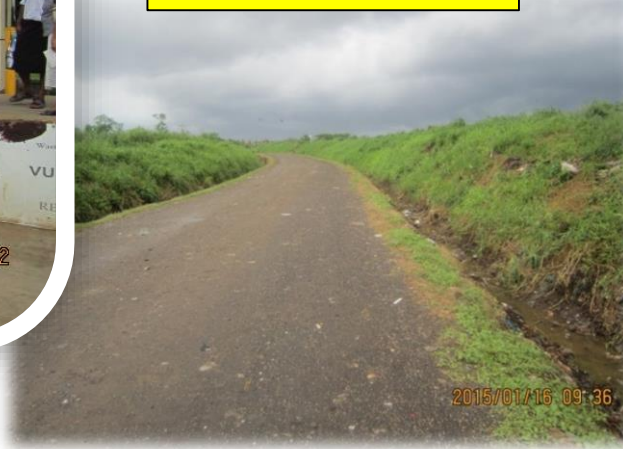
Waste Category	Grand Total		Tipping fee	Amount (\$)	
<b>City Area</b>	<b>3,434.63</b>	<b>80.0%</b>		<b>51,989.43</b>	<b>63.5%</b>
Garbage collection(1)	565.00	13.2%	23.00	12,995.00	15.9%
Green (incl. Ravin)(9)	83.70	1.9%	11.00	920.70	1.1%
Park(12)	30.78	0.7%	11.00	338.58	0.4%
Drain/Street Sweeping(11)	117.43	2.7%	11.00	1,291.73	1.6%
Market(7+8)	38.50	0.9%	11.00	423.50	0.5%
Others(LCC,Ravin) 16	2296.26	53.5%	11.00	25,258.86	30.9%
Special Waste (27)	16.30	0.4%	46.00	1,399.80	1.7%
H/hold direct discharge (2)	0.60	0.0%	11.00	6.60	0.0%
Business (5)	210.52	4.9%	31.00	6,526.12	8.0%
Hotel Waste (14)	0.86	0.0%	26.00	22.36	0.0%
Garbage (others)1	0.00	0.0%	23.00	0.00	0.0%
Hospital Ash (22)	0.00	0.0%	21.00	0.00	0.0%
Factory waste (18)	52.90	1.2%	31.00	1,639.90	2.0%
Construction Waste (23)	5.10	0.1%	26.00	132.60	0.2%
Condemned Food (20)	16.68	0.4%	26.00	1,033.68	1.3%
Others (16)	0.00	0.0%	31.00	0.00	0.0%
<b>Outside City area</b>	<b>858.61</b>	<b>20.0%</b>		<b>29,869.16</b>	<b>36.5%</b>
NTC Garbage (3)	360.65	8.4%	32.00	11,540.80	14.1%
Construction(24)	5.40	0.1%	34.00	183.60	0.2%
Factory(19)	0.00	0.0%	40.00	0.00	0.0%
Hotel (15)	96.12	2.2%	32.00	3,075.84	3.8%
H/hold direct discharge (4)	15.72	0.4%	14.00	220.08	0.3%
Business (6)	278.2	6.5%	40.00	11,128.00	13.6%
Condemned food(21)	17.70	0.4%	34.00	951.80	1.2%
Special waste(28)	23.80	0.6%	57.00	1,606.60	2.0%
Garbage (excl. NTC)(3)	17.12	0.4%	32.00	547.84	0.7%
Park (13)	0.00	0.0%	14.00	0.00	0.0%
Drain/Street Sweeping(29)	43.90	1.0%	14.00	614.60	0.8%
<b>Grand Total</b>	<b>4,293.24</b>	<b>100.0%</b>		<b>81,858.59</b>	<b>100.0%</b>
<b>Recycle -Waste pickers</b>	<b>30.1</b>			ton/month	
<b>Weighbridge fees (32)</b>				546.00	
<b>Grand Total Income</b>				<b>82,404.59</b>	

# Improvement Works conducted under the 3R/J-PRISM /Shibushi Model Project



Visits to VDS

Access and Drainage



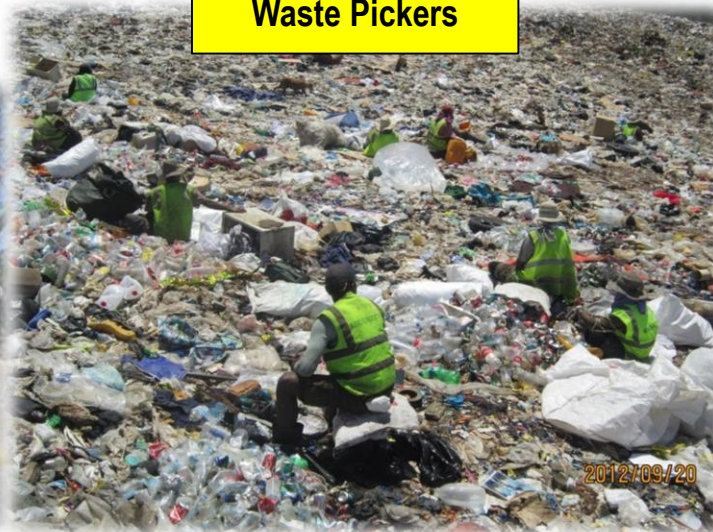
Market Waste Composting



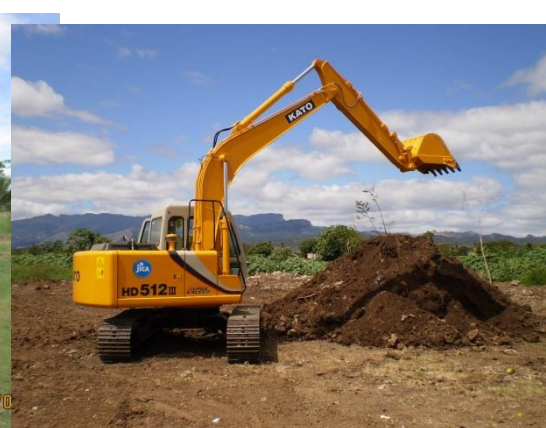
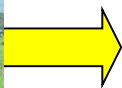
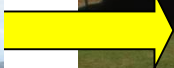
Weighbridge



Waste Pickers









# Access Improvements





# Vunato Disposal Site Operation

Periphery banks



Waste Pickers



Drain Maintenance



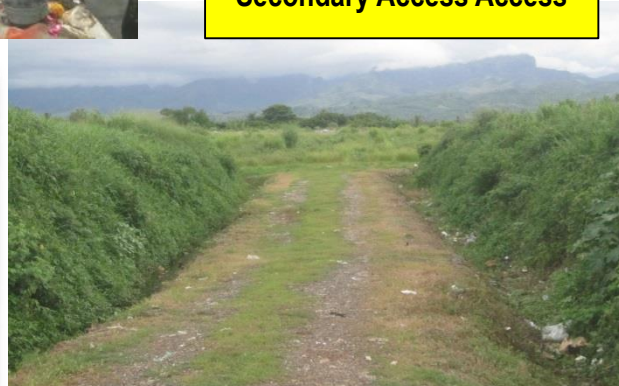
Secondary Access Access



Litter free Canals to sea



Secondary Access and cell under rehabilitation



Disposal Site





# Let's make it a success!!

Vinaka!!



## Ever Green, Ever Clean, Lautoka City



Green waste chipping



Market waste composting



Home Composting



Separate collection of recyclables



3R's promotion at school

## Minimize Waste - Practice 3R's ! (Reduce, Reuse & Recycle)



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