

# Waste Management Initiatives and Challenges of Nepal

Presented by

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# Outline of the presentation

- Policy and legal initiatives in solid waste management
- Current approach and practices
- Quantity and types of waste generation
- 3R approach in management system
- Public, Private Partnership approach
- Challenges

# Policy and legal initiatives

- **SOLID WASTE MANAGEMENT AND RESOURCE MOBILIZATION ACT, 1987**
- **THE TOWN DEVELOPMENT ACT, 1988**
- **LOCAL SELF GOVERNANCE ACT, 1999**
- **THE NEPAL ENVIRONMENT POLICY AND ACTION PLAN, 1993**
- **NATIONAL WASTE MANAGEMENT COUNCIL, 1996**
- **THE ENVIRONMENT PROTECTION ACT, 1997**
- **ENVIRONMENT PROTECTION RULE, 1997**

# Current approach and practices in SWM

- Door-to-door collection
- Source segregation at the household level
- Composting at the household level (Reduce/reuse)
- Initiating User's fee system-ownership/rights
- Involvement of NGOs and private sectors
- Vermi-composting
- Waste collection and transport to landfill sites not regular
- Garbage of waste remain in the public place for long-time
- Dumping of household waste on the banks of river

# Generation of waste in KMC

Population approx.	8,00,000
Population growth rate	3.25%
Waste generation	0.25 kg/day
Others (VDC, Commercial, day pop. etc.)	0.15kg/day

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**per capita waste generation 0.40Kg/day**

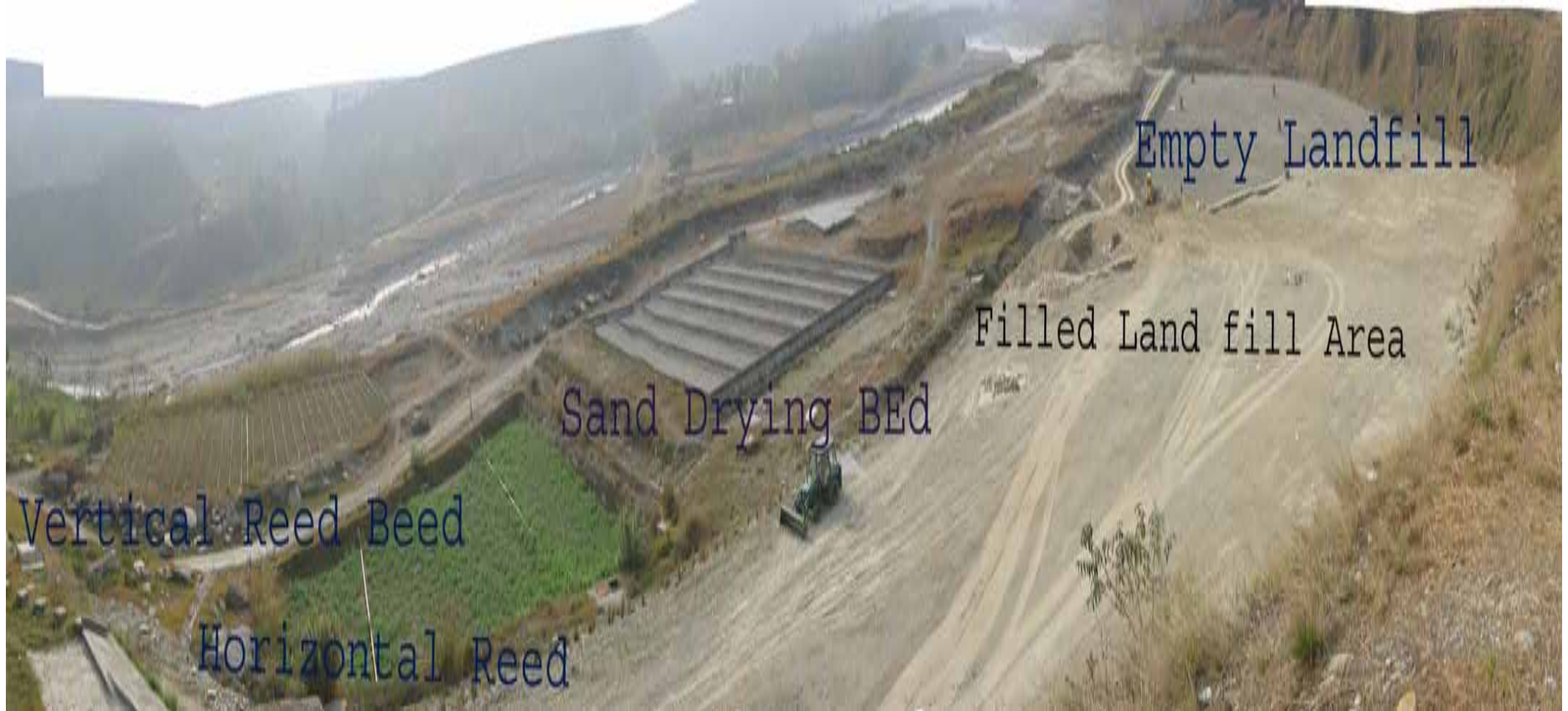
**Total Generation 320 ton/day**

**Municipal Collection 300 ton/day**

# Composition of Municipal Waste

■ Garbage	72%
■ Paper	12%
■ Plastic	8%
■ Textile	3%
■ Rubber/Leather	3%
■ Others	2%

**An overview of Pokhara  
SANITARY LANDFILL SITE**



Empty Landfill

Filled Land fill Area

Sand Drying BEd

Vertical Reed Beed

Horizontal Reed

## **POKHARA SANITARY LANDFILL SITE**



# **Pokhara Environment Improvement Project**

- 1. Public awareness and environment education**
- 2. Sanitation facilities improvement**
- 3. Sanitary Landfill Site**
- 4. Land use concept plan**
- 5. Storm water drainage improvement**
- 6. Urban road improvement**

# Sanitary Landfill Site:



# Location:

- **Bachhebuduwa, ward no.18,**
- **near the converging point of Seti river and Phurse Khola**
- **670m high from MSL**
- **9 km away from Prithivi Highway**



- **Construction started : Poush 2056(Dec 1997)**
- **Construction completed: Ashad 2060 (June 2003)**
- **Inauguration date : 24th Magh 2061(Jan 2004)**



# Area:



<b>Landfill Area</b>	<b>: 80 Ropani</b>
<b>Treatment Area</b>	<b>: 30 Ropani</b>
<b>Buffer Zone, Internal road and other infrastructure</b>	<b>: 75 Ropani</b>
<b>Composting Area</b>	<b>: 15 Ropani</b>
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<b>Total</b>	<b>: 200 Ropani</b>

# Construction Cost:

Access Road Construction : NRS 7,42,31,314.00 (Donation)

Treatment Plant " : NRS 4,00,85,774.00 (Loan)

Landfill Area " : NRS 3,48,52,154.00 (Loan)

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: NRS 14,91,69,283.00

Equipment Cost : NRS 4,92,16,926.00 (Loan)

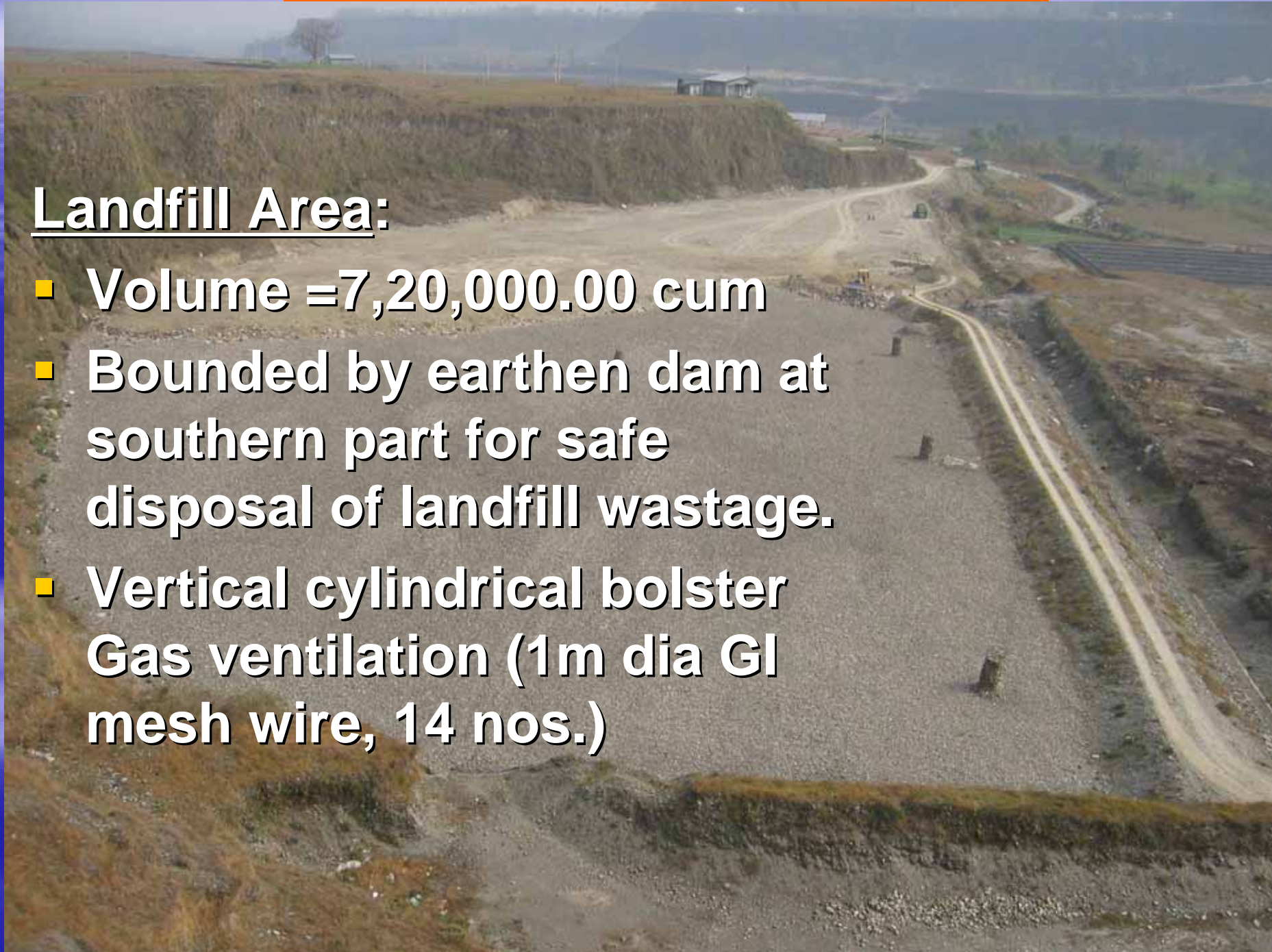
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Total Cost : NRS 19,83,86,209.00

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# Structures/Function

## Landfill Area:

- Volume = 7,20,000.00 cum
- Bounded by earthen dam at southern part for safe disposal of landfill wastage.
- Vertical cylindrical bolster Gas ventilation (1m dia GI mesh wire, 14 nos.)





GARBAGE UNLOADING BY COMPACTOR



GARBAGE COMPACTION BY CHAIN DOZER



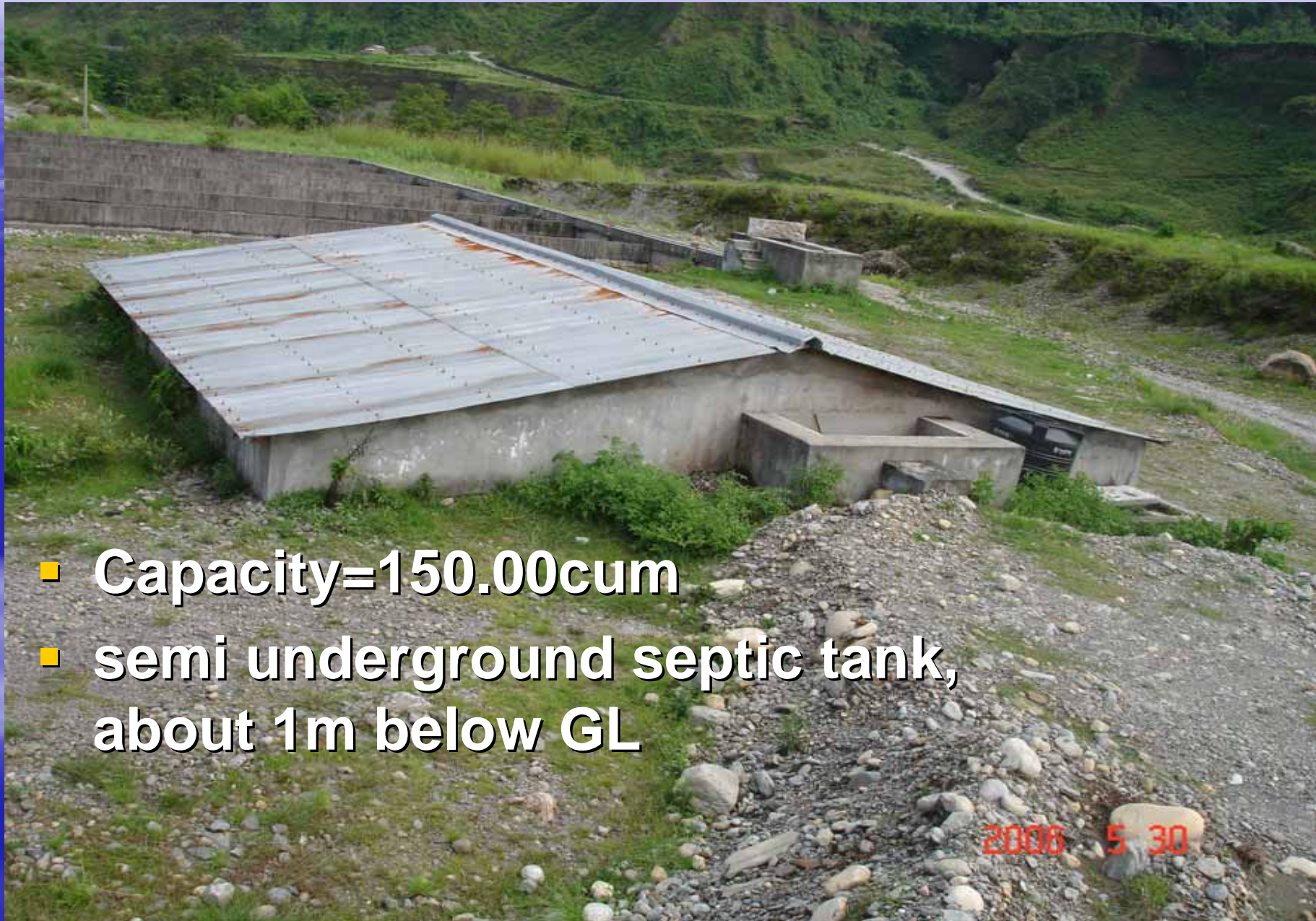


Covering the waste by soil 5 30



Soil spreading by loader

# Septage settlement Tank (SST):



- Capacity=150.00cum
- semi underground septic tank, about 1m below GL

# Sand Drying Bed (SDB):



- Size=-41.15m X41.15m
- divided in seven compartments
- As a filter material, five different grade of gravel varying large to small from bottom to top.

2006 5 30

# Function of SDB:

- to settle the solid waste on the sand bed



- to filter the liquid in primary level



# Treatment Plant:

1. Horizontal Reed Bed (HRB)

Area=1105.00 sqm

2. Vertical Reed Bed (VRB)

Area=2203.00 sqm

Treatment Capacity= 75.00 cum/day of septage

40.00 cum/day of solid waste leachate

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115.00 cum/day

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Horizontal Reed Bed



Vertical Reed Bed

# Surface water collection Basin:

VOLUME = 270.00 CUM





# Composting Area:



# Equipments:

S.No.	Equipments	Total Nos.	Remarks
1.	Tripper	7	
2.	Compactor	4	
3.	Loader	2	
4.	Dozer	2	
5.	Septage Tanker	2	
6.	Suction cum Jetting	2	
7.	Tractor	2	
	<b>Total</b>	<b>21</b>	

# Operation Cost borne by PSMC

For F.Y. 2061/2062(04/05): RS 65,00,000.00

US\$89041

For F.Y. 2062/2063(05/06): RS 1,56,92,798.00

(US\$214969)

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RS 2,21,92,798.00

(US\$ 304010.9)

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**Land Fill Area Before  
Disposing Solid Waste**



**Slope Protection work at Jhakrithan**



Leachate from landfill area

Leachate from landfill area and SDB





Treated Leachate from VRB



Out let to river

# Organic Waste





# Reusable Waste





Medical waste

# Solid waste disposed on the banks of the river



# Challenges

- Awareness building within the community-  
Concept of ADICAS



# Challenges

- Enforcement of legal/economic instruments
- Collective approach: empowerment of community participation- 3R approach
- Cooperation and coordination among the private/public sector organization and INGOs
- Adoption of best available technology-NGOs and Private sector-WEPCO-organic compost
- Upstream/downstream approach for extended producer responsibility (EPR) and sustainable waste management
- Extend collaboration/strategic partnership with INGOs for sustainable management of waste (SW, EW, MW and Hazardous waste).

# Expectation from 3R Secretariat

- Strengthening regional cooperation for 3R:
  - Technical support
  - Human resource development
  - Institutional strengthening

Thank you!

Arigato Gojaimasu !