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

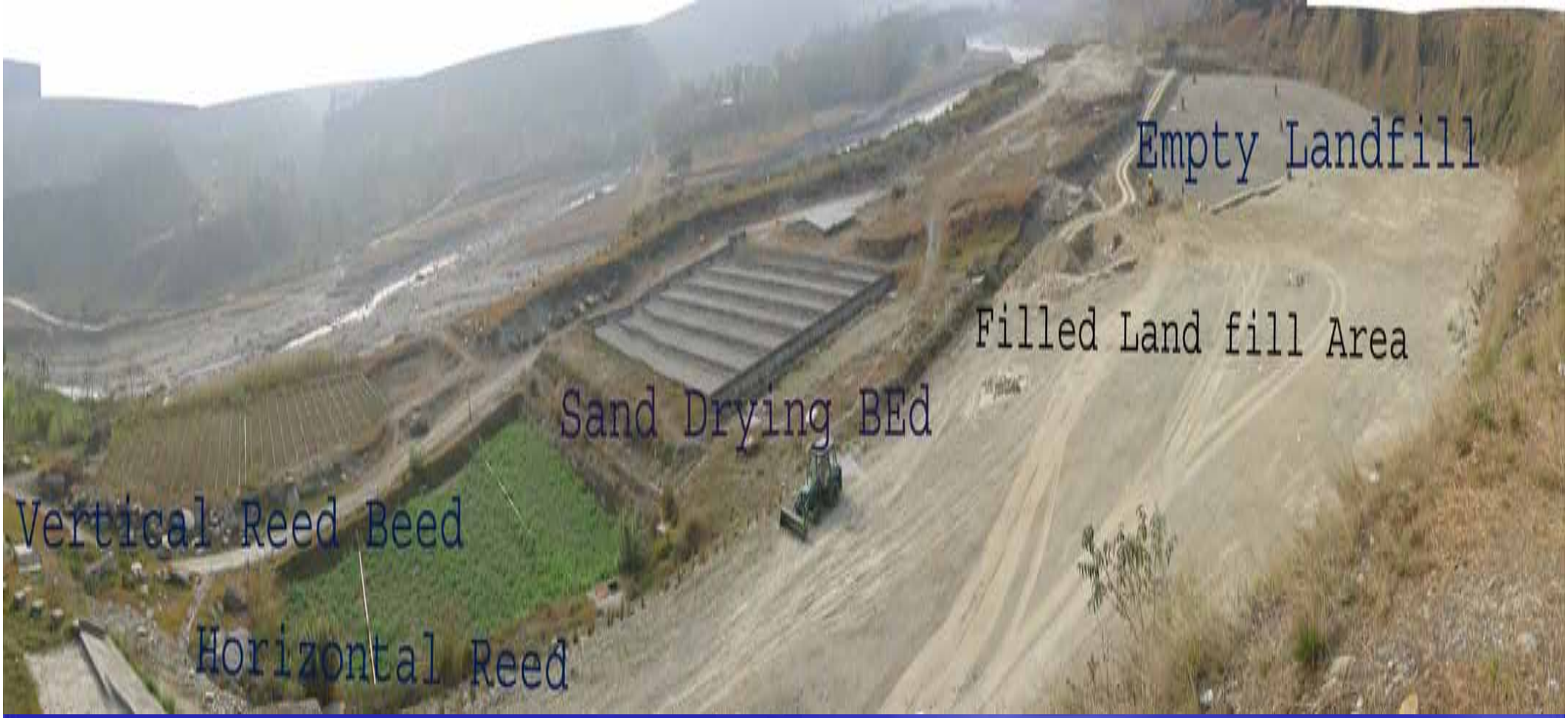
Population approx.	8,00,000
Population growth rate	3.25%
Waste generation	0.25 kg/day
Others (VDC, Commercial, day pop. etc.)	0.15kg/day

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



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)

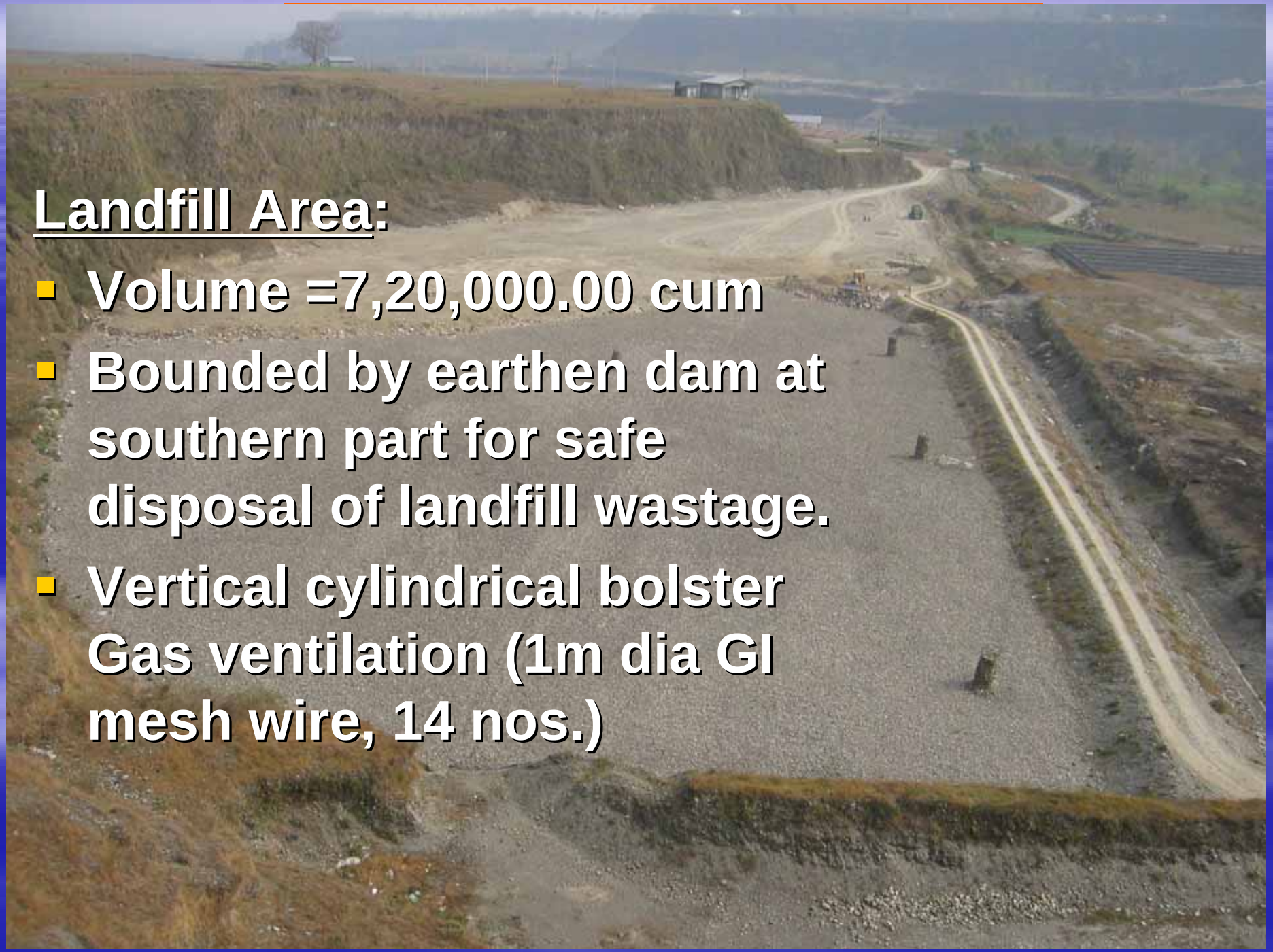
Area:

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

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)
	: NRS	14,91,69,283.00
Equipment Cost	: NRS	4,92,16,926.00 (Loan)
Total Cost	: NRS	19,83,86,209.00

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.)**

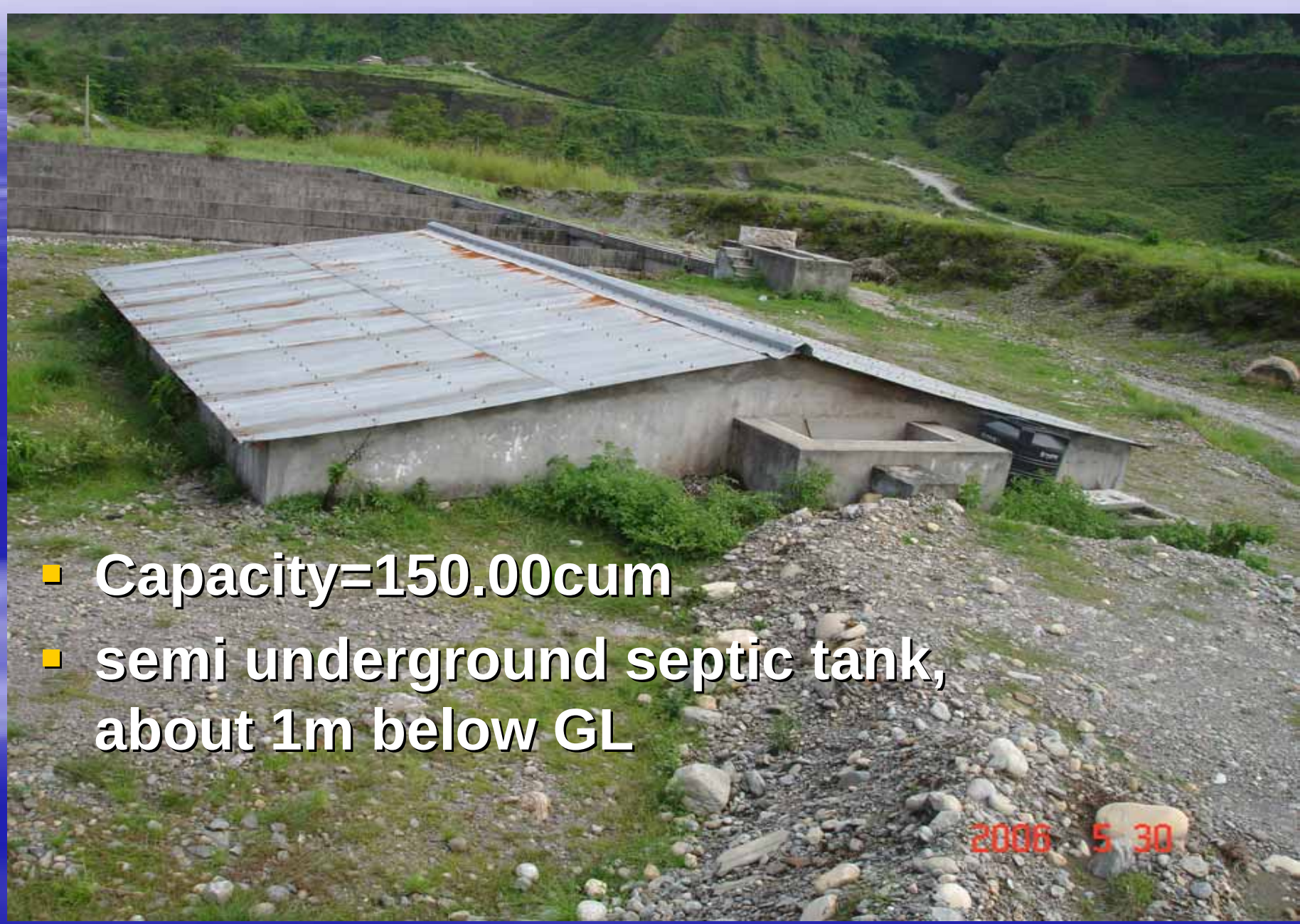
GARBAGE UNLOADING BY COMPACTOR

GARBAGE COMPACTION BY CHAIN DOZER


Covering the waste by soil

Soil spreading by loader

Septage settlement Tank (SST):

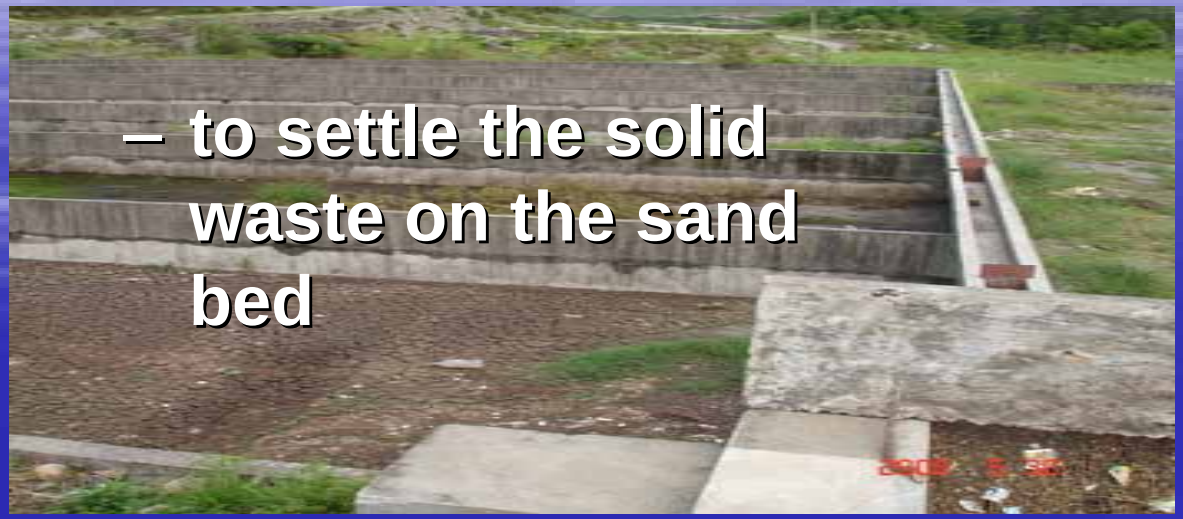


- Capacity=150.00cum
- semi underground septic tank, about 1m below GL

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.

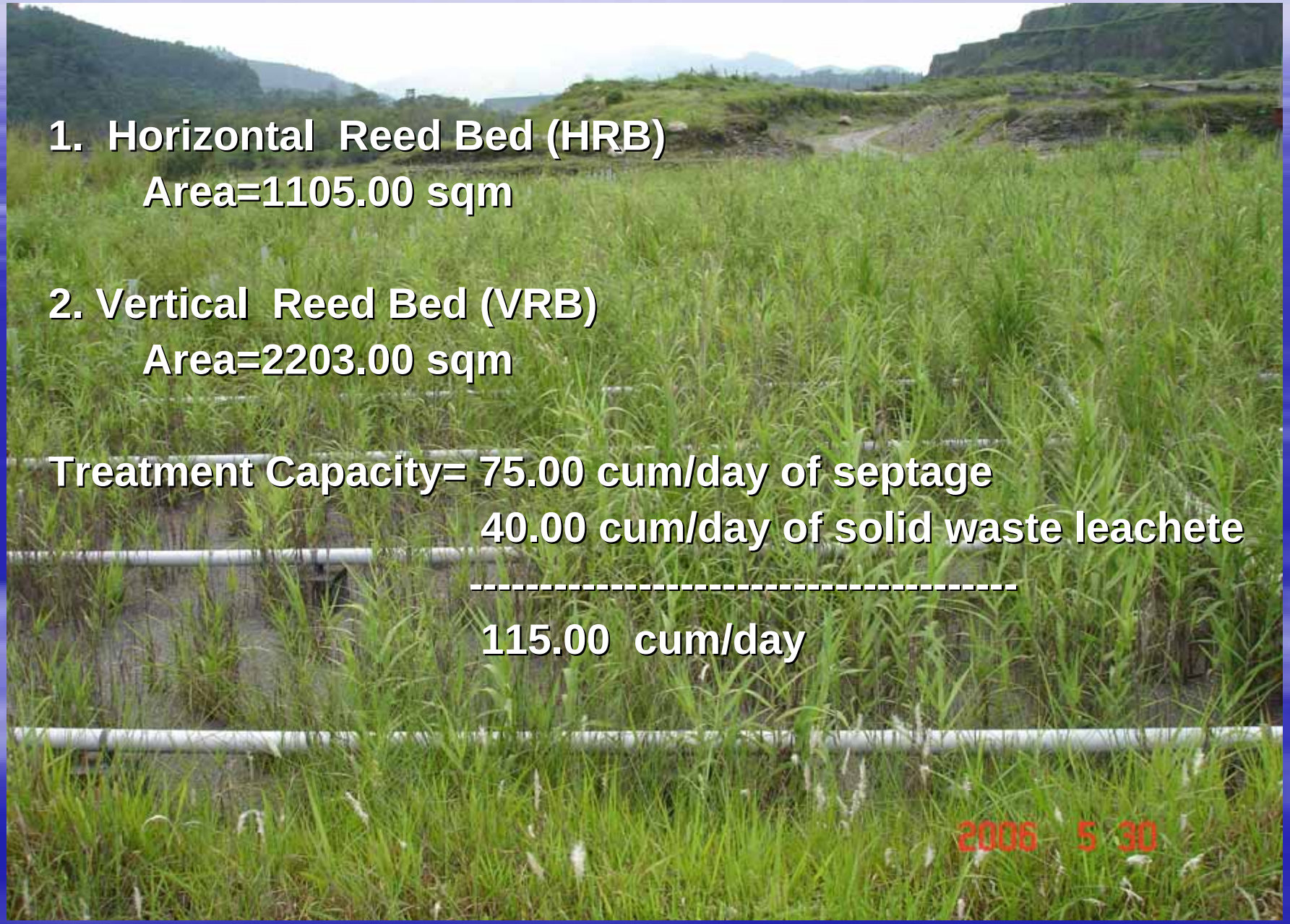
Function of SDB:



– 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 leachete

115.00 cum/day

Horizontal Reed Bed

Vertical Reed Bed

Surface water collection Basin:

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	
	Total	21	

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)

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

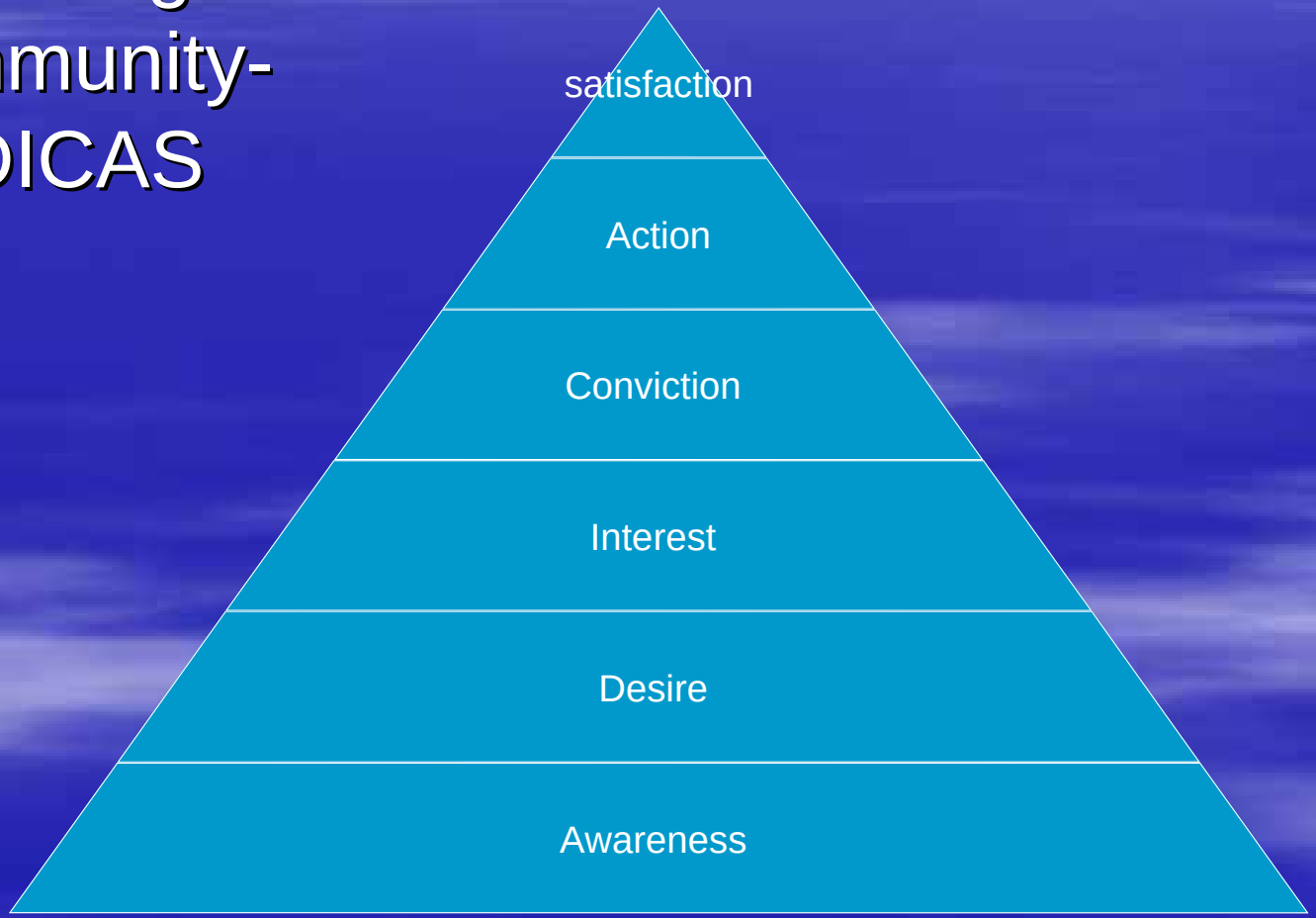
Reusable Waste

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 !