

WASTE WATER TREATMENT IN SOUTH SUMATRA : BETWEEN OPPORTUNITIES AND CHALLENGES

Presented by:

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> Environmental Agency The Government of South Sumatra 2014

> > **INTRODUCTION**

Region Profile



Area: 91,774.99 km2 Shore Line : +445 km Population : ± 8.4 milliion

13 Regencies 231 Sub District 4 Municipalities 384 Urban Villages 2,812 Rural Villages

Surface Water in South Sumatra



Main River : Sungai Musi

- drains 750 km long
- pass 8 regencies and 1 municipality

Tributaries:

- 1. Komering
- 2. Ogan
- 3. Lematang
- 4. Musi Hulu
- 5. Semanggus
- 6. Kelingi
- 7. Kikim
- 8. Lakitan
- 9. Batang Hari Leko
- 10. Rawas
- 11. Musi Hilir



Data : water quality in 72 monitoring points which are widespread in South Sumatra

	2010	2013
Good	0	0
Fair	0	0
Deteriorated	65	58
Highly Deteriorated	7	14

Water-Quality Parameters of highly deteriorated point

Status Mutu Kualitas Air Menurut Sistem Nilai Storet Stasiun Pulau Pinang

	LAHAT									
No.	PARAMETER	UNIT	PERIODE SAMPLING		BMI	MAX	MIN	AVERACE	SKOPS	
			1	2	3	DIVIL	MAX	MIIN	AVERAGE	SKURS
	FISIKA									
1	TDS	mg/L	54.70	8.77	50.50	1000.00	54.70	8.77	37.99	0
2	TSS	mg/L	10.00	58.50	18.60	50.00	58.50	10.00	29.03	-1
	KIMIA									
3	pН	Unit	7.30	8.00	7.41	6.00	8.00	7.30	7.57	0
4	BOD5	mg/L	1.60	1.47	1.40	2.00	1.60	1.40	1.49	0
5	COD	mg/L	9.48	9.73	9.11	10.00	9.73	9.11	9.44	0
6	Amonium	mg/L	0.02	0.26	0.03		0.26	0.02	0.10	0
7	NO3-N	mg/L	1.70	16.00	1.20	10.00	16.00	1.20	6.30	0
8	NO2-N	mg/L	0.04	0.01	0.02	0,06	0.04	0.01	0.02	0
9	Phenol	ug/L	0.05	0.05	0.03	1.00	0.05	0.03	0.04	0
10	Cr (VI)	mg/L	0.05		0.02	0,02	0.05	0.02	0.03	-8
11	Khlorida	mg/L	18.70	10.20	12.60	600.00	18.70	10.20	13.83	0
12	Deterjen	ug/L	0.00	0.14	0.12	200.00	0.14	0.00	0.09	0
13	Phosphat	mg/L	0.03	0.14	0.06	0,2	0.14	0.03	0.08	0
14	Sulfat	mg/L	18.00	18.00	7.00	400.00	18.00	7.00	14.33	0
15	Minyak Lemak	mg/L	0.20	0.20	0.20		0.20	0.20		0
	MIKROBIOLOGI									
16	Coliform Tinja	jlh/100 ml	Negatif	300.00	100.00	100.00	300.00	100.00	133.33	-12
17	Total Coliform	jlh/100 ml	3,000.00	3,100.00	1,600.00	1000.00	3,100.00	1,600.00	2,566.67	-15
	STATUS MUTU AIR									-36

Three major sources of Water Pollution :

1. Industrial Activities

fertilizers; oil and mining; Crumb Rubber; Palm oil; and Pulp and Paper

2. Agriculture

Paddies and Plantation (individual and corporate)

3. Domestic

Human (water and Solid Waste), dumping solid waste, and water transportation

LARGEST CONTRIBUTION OF GREEN HOUSE GASES FROM WASTE SECTOR IN SOUTH SUMATRA

Estimation of GHG (2012) Category/Sub Category ton CO2-eq 4A1: Domestic solid waste disposal 187.630 4A2: Composting 664 4A3: Open burning 202.395 4D1: Domestic Wastewater treatment&discharge 689.350 510.220 4D2: Industrial wastewater (karet + sawit) Jumlah 1.590.259 4A1: Domestic solid waste disposal 12% 0% 32% 4A2: Composting 4A3: Open burning 4D1: Domestic Wastewater treatment&discharge 4D2: Industrial wastewater Crumb Rubber and Palm Oil 43%

Tabel 4. Estimation of GHG from waste sector (data tahun 2012)

Graph. Contribution per Sub-Category of GHG in South Sumatra From Waste Sector

Managing and Controlling Quality of Environment in South Sumatra

Commitment of Provincial Government on Managing and Controlling Environments



Provincial Government – Environmental Agency

VISION

Achieving good and healthy environment to support environmentally sustainable development in South Sumatra

MISSION

• Pursuing better quality of environment, including water, air and land cover

• Controlling the increase of Green House Gas Emission

• Enhancing Capacity Building of Environmental Agency on Managing Environment

Activities on Managing and Controlling Environment

Managing Environment:

- 1. Assessing environmental performance on 100 companies. Those have to comply government regulations on controlling environment.
- 2. Educating people on environmental awareness.
- 3. Monitoring Air and Water Quality for Basis Data on development.
- 4. Constructing facilities of integrative domestic wastewater treatment in three points.

Communal Wastewater Treatment Plant

BACKGROUND



People who live near the river, do washing and bathing.

Water are mostly polluted by Fecal Coli and other chemicals from wastewater discharge as well as fertilizers... (refer to data)



Alongside Musi River, People have floating toilets for defecation and urination

Traditional group, who do not have sufficient knowledge on healthy sanitation and have economic constraints, have one toilets for one family

Communal Wastewater Treatment Plant

- Municipal Government construct three Communal Wastewater Treatments Plants; located in Jayalaksana, Prajuritnangyu, and Kasnariansyah.
- The areas are highly populated. Kasnariansyah is noted about 1000 people live in rented flat. In Jayalaksana and Prajurit nangyu there are about 2000 people each location (slum areas)

Technology : Anaerobic Baffle Reactor





TOILETS in Communal Wastewater Treatment Plant



Temporary collecting tank



Biogas from Biodigester

BENEFITS:

- Low cost operation system
- Bio-gas can be used for cooking and electricity
- Ecological friendly waste (minimum impact)
- Healthy sanitation
- Economic generation (payment service affordable)
- Sustainable development because water is less deteriorated.

POTENCY OF METHANE EMISSION FROM DOMESTIC WASTEWATER IN SOUTH SUMATRA

Turn of works water treatment		Emisi CH ₄	
Type of wastewater treatment	IVICF	(ton CO2-eq)	Fraksi
Septic tank (individual)	0,5	353.975	57,5%
Communal Wastewater treatment (aerobic) – Unmanaged very well	0,3	3.172	0,5%
Direct dumping to environment	0,2	75.362	12,2%
To pond/rice field	0,5	17.128	2,8%
Wet latrine	0,7	165.854	26,9%
Total emisi CH ₄		615.492	100%
Source: Inventory team of GHG BLH Sumsel in 2012			

Tabel . Estimation of Methane (CH4) per domestic wastewater treatment in South Sumatra

a. Distribution of Wastewater treatment and discharge in South Sumatra (Riset Kesehatan Dasar, Kementrian Kesehatan RI, 2010): 49,6% septic tank (individual)

1,7% Communal Wastewater Treatment Plant (aerobik) 2,4% to pond/rice field

Notes:

b. Degradable Organic component = 40 gram/(person.day) = 14,6 kg BOD/cap.yr (Table 6.4 IPCC 2006 Volume 5 Asia, Middle East and Latin America.

2.2% to beach

^{26,4%} direct dumping to environment

^{16.6%} wet latrine 1,1% others.

Challenges :

- Institution for managing installation.
- Public awareness (Public Participation)
- Budget for maintenance.
- Less coordination among stakeholders, people, local government and its up-line institution
- Less studies for development this method
- There are 353,975 ton CO₂ eq (produced from Methane in individual Septic Tank)

Conclusion

- Communal Wastewater Treatment Plant have to be developed in South Sumatra, especially in Highly Populated areas
- As complexity problems on environments, we need to encourage people, other groups (academia and NGO) to participate on managing environment.





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