DEMONSTRATION SITE FOR COUNTERMEASURES OF WASTE WATER IN NORTH SUMATRA PROVINCE (POLICY OF WASTEWATER TREATMENT MANAGEMENT IN NORTH SUMATRA)

ENVIRONMENTAL PROTECTION AGENCY
OF NORTH SUMATRA PROVINCE

SURABAYA, 2014

OUTLINE

1. Introduction
2. GHG Inventory in North Sumatra Province
3. Survey Potential of GHG industrial wastewater
4. Proposal for Management and Policy direction of Domestic wastewater
5. Johkasou System for North Sumatra
6. Conclusion

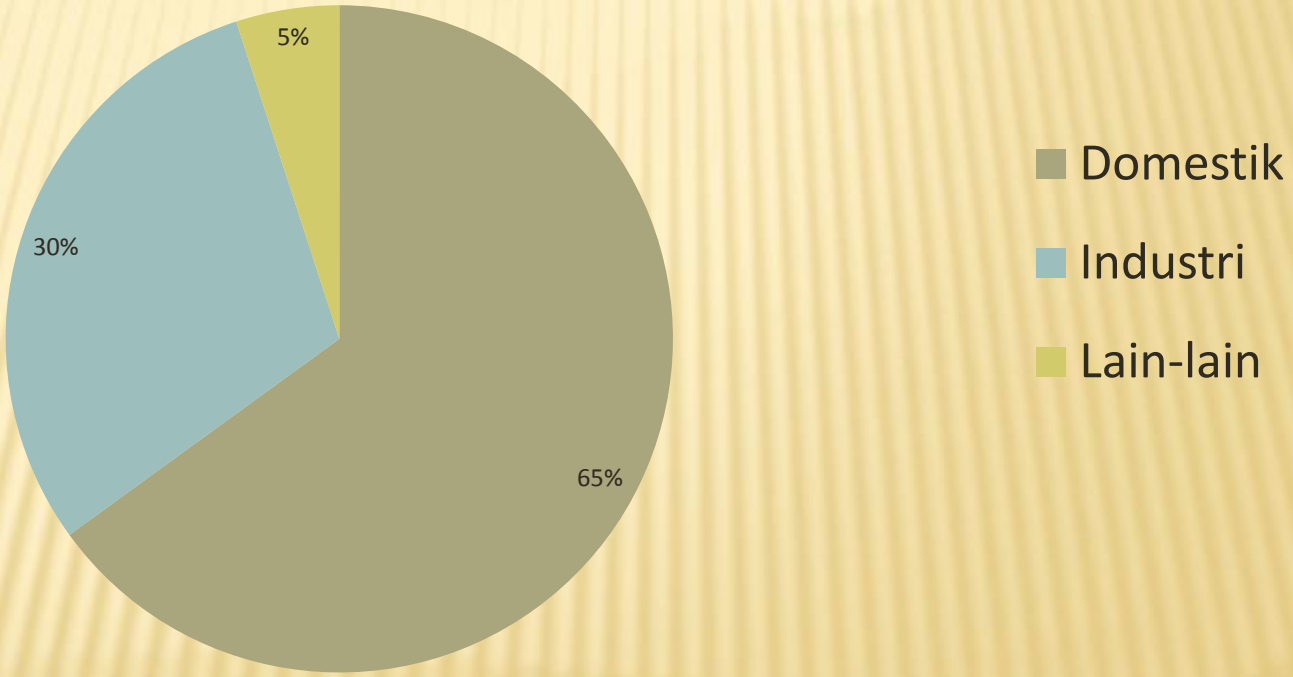
INTRODUCTION

a. Strategic Issues

- Water quality of surface water (lake Toba , deli river, Asahan river , coastal and the sea)
- Solid Waste Management
- Management of Domestic wastewater
- Damage of Mangrove, logging, Conversion of land and forest fire
- Waste Water and Air Pollution of Industrial
- Law enforcement
- Climate change
- Ground water and mineral exploitation
- Environmental Impact Analysis
- Mechanism of coordination
- Green PDRB
- License of B3
- Community involvement
- Accuracy of Data management
- Operational of Environmental Laboratory of Kab/Kota

CASE STUDY: RESOURCE OF WATER POLLUTANT IN NORTH SUMATRA

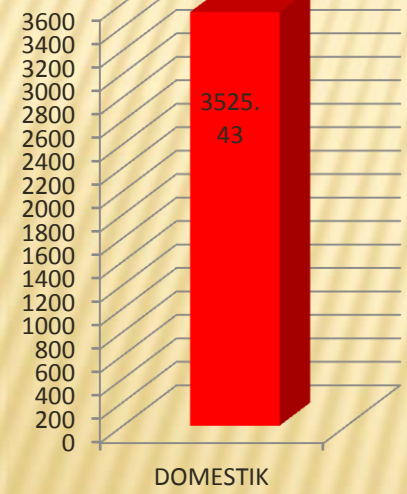
RESOURCE OF POLLUTANT TO DELI RIVER IN MEDAN (SOURCE : DEMS PROJECT-JICA, 2003 - 2007



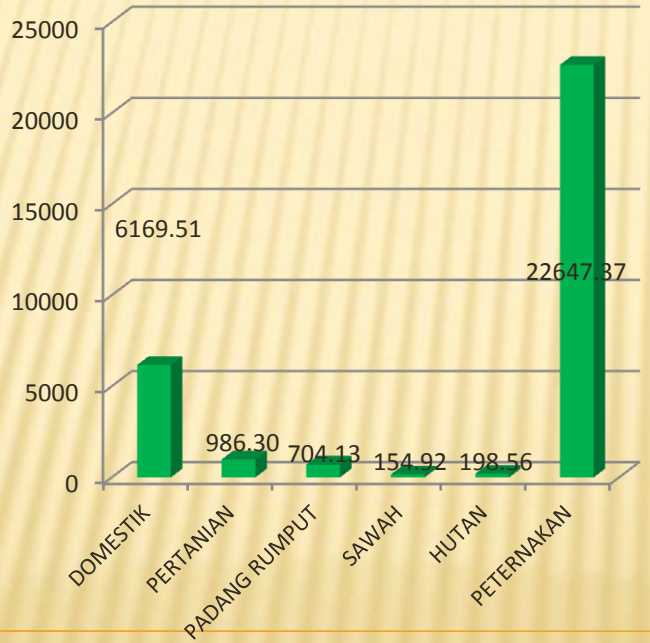
Carrying Capacity Study, Water environment of Danau Toba (source: BLH SU, 2012)

NUMBER OF POLLUTION OF DANAU TOBA FROM EACH RESOURCES FOR BOD,COD PARAMETER AND TOTAL NITROGEN IN TON/YEAR

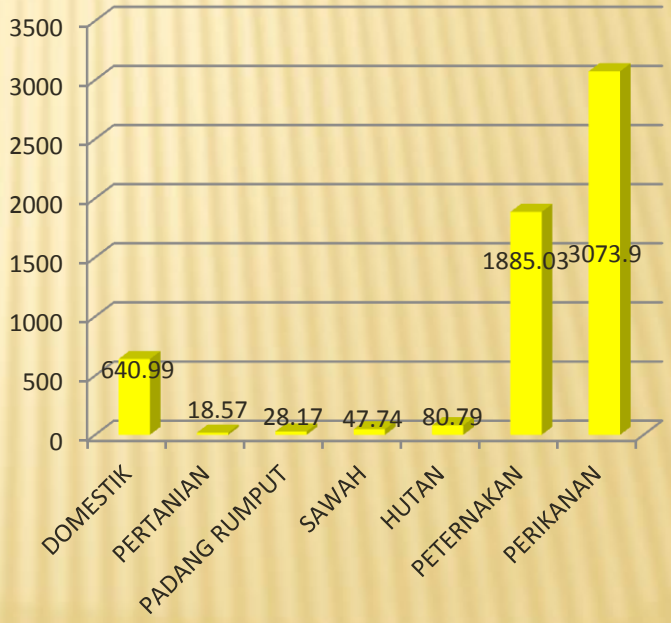
PARAMETER BOD (TON/YEAR)



PARAMETER COD (TON/YEAR)



PARAMETER TOTAL NITROGEN (TON/YEAR)

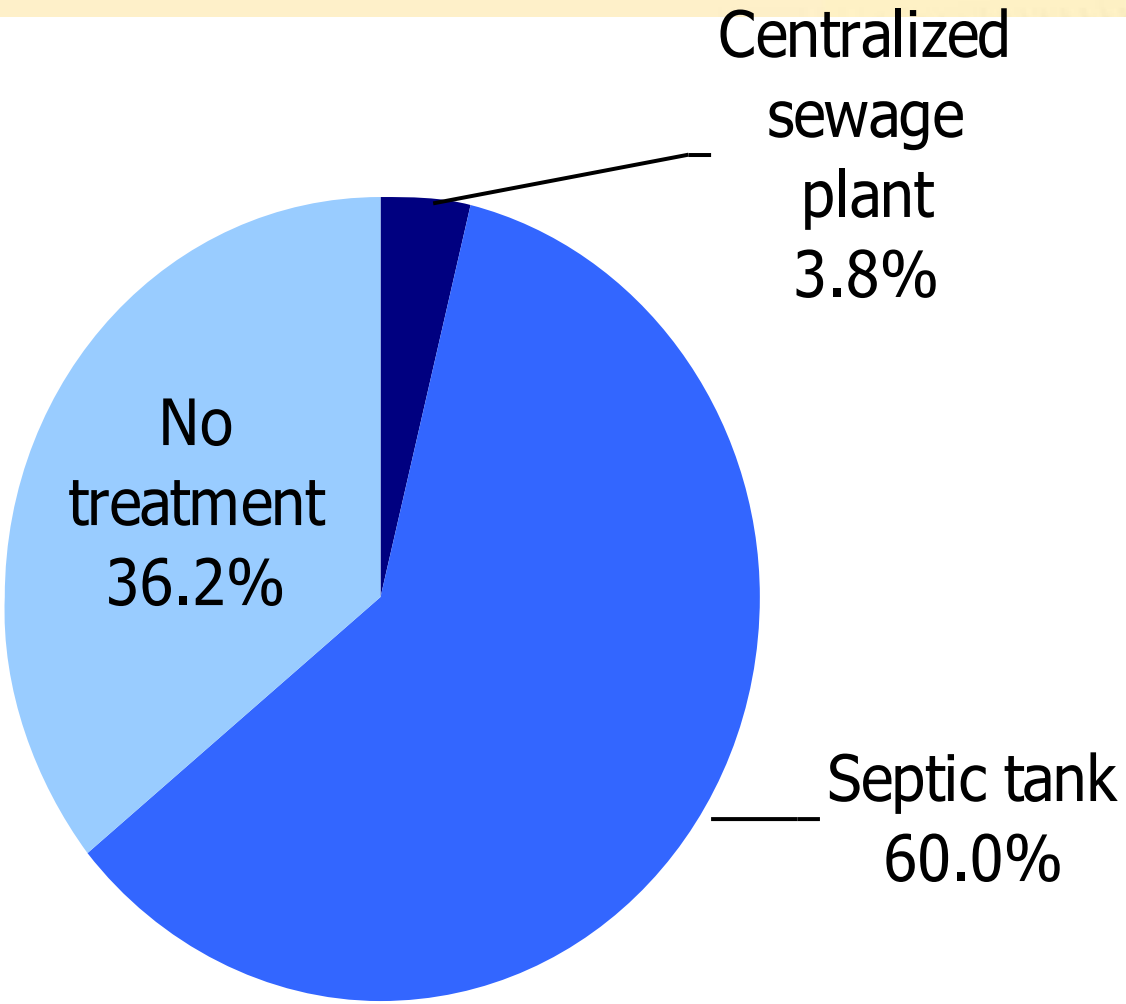


b. **Current condition**

- The number of population in North Sumatera : 12.985.075 (SP2010), wide area: 71.680.,7 km2 or 3.037.716 household by population density 181 people per km2.
- Water consumption average of Medan = 160 L/org. Day by amount 481.286 Household (USAID 2006)
- The improvement of clean water needs will improve domestic waste water volume as well which is produced by number of waste water which is streamed into drainase 60 - 70% of clean water consumtion (USAID, 2006).

- Centralized sewage system in Medan covers only 0.6% of population in North Sumatra and 3.8% in Medan.
- Capacity of centralized sewage treatment plant in Medan will be expanded double in 2015, however, dominant domestic wastewater treatment method in North Sumatra is still septic tank in the future.

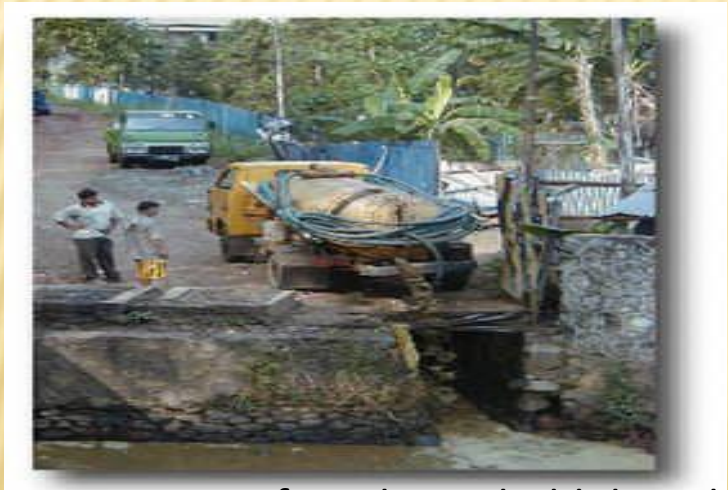
✖Septic Tank System: without previous treatment and directly to the land. Generally consist of 3 systems : 1 chamber, 2 chamber or laterine system



Domestic wastewater treatment in Medan

Waste in drainase

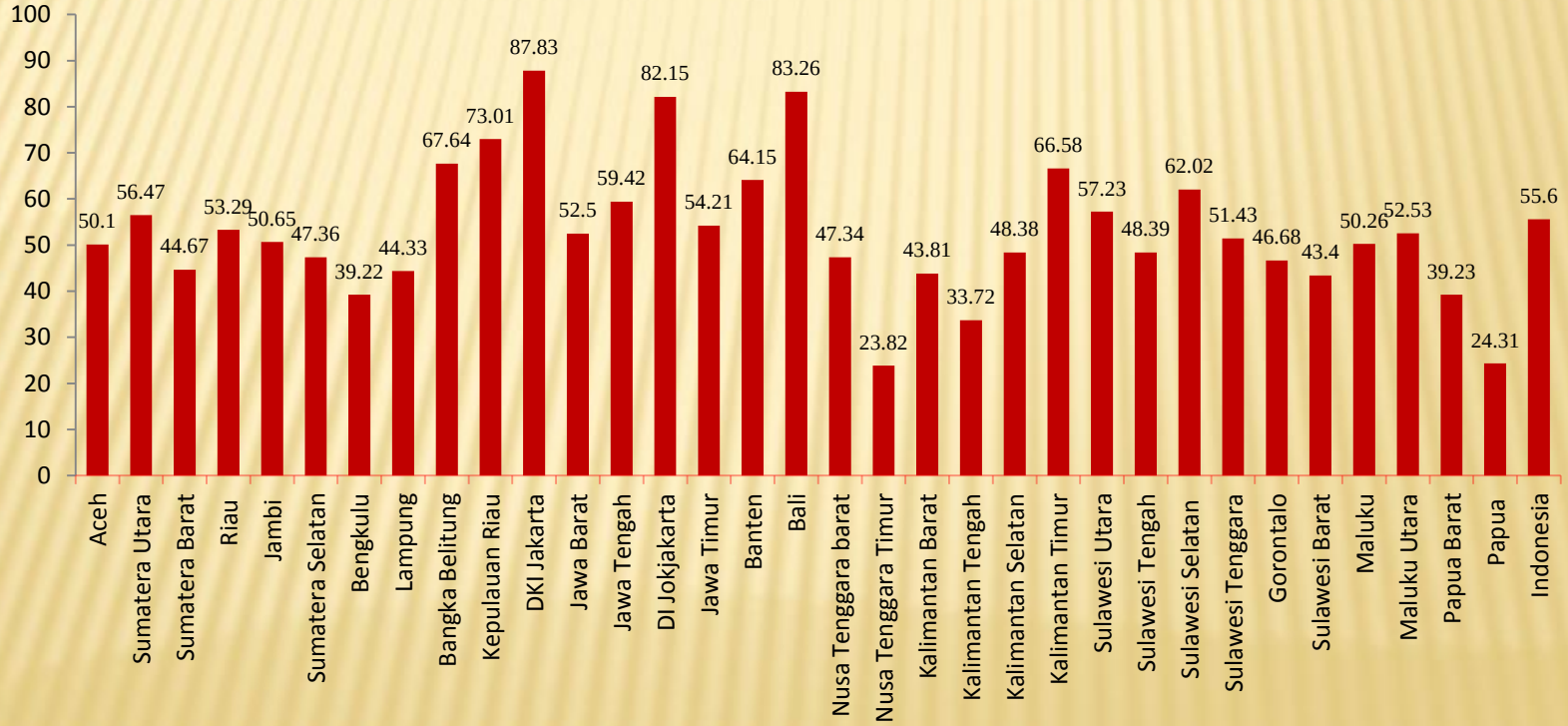
Defecate in any place



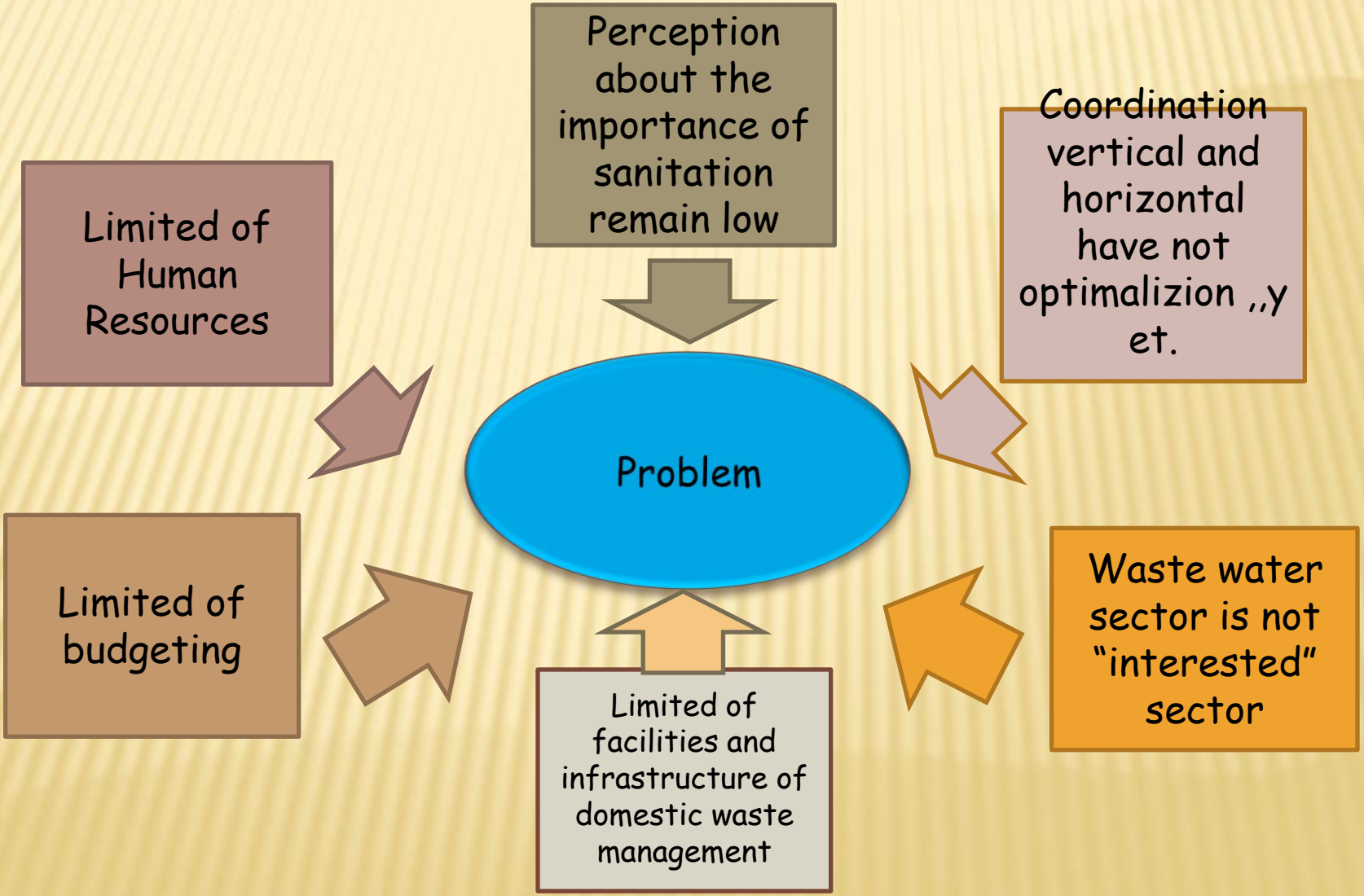
Sewerage System from household directly to public drainase or river without treatment

Bath, waste, toilet in river

Sanitation coverage in North Sumatra only reach 56.47 % of the total population of North Sumatra 12.985.075 (SP2010) or 7,332,671 souls. The number of household 3.037.716 households.
Higher than national sanitation coverage
is 55.60 % (Public Works Ministry).



SCHEME PROBLEMS



II. GHG Inventory in North Sumatra Province

- ✓ Green House Gas Inventory in North Sumatera.
- ✓ Planning of Mitigation action which will be conducted.
- ✓ Improving of Human Resources capacity of Province and kab/kota in conducting GHG inventory activities.

RAD North Sumatra Province

BAU BASELINE DOMESTIC WASTE

No.	Tahun	Emisi GRK (Gg CH4)			Emisi GRK (ton CO2 eq)		
		Limbah Padat	Limbah Cair	Total	Limbah Padat	Limbah Cair	Total
1	2010	60,23	39,39	99,62	1.264.741	827.275	2.092.016
2	2011	98,60	39,91	138,51	2.070.611	838.180	2.908.791
3	2012	125,81	40,44	166,25	2.642.065	849.228	3.491.293
4	2013	145,57	40,97	186,54	3.056.904	860.423	3.917.327
5	2014	160,35	41,51	201,86	3.367.319	871.765	4.239.084
6	2015	171,82	42,06	213,88	3.608.272	883.256	4.491.529
7	2016	181,11	42,61	223,73	3.803.389	894.899	4.698.289
8	2017	188,97	43,18	232,15	3.968.405	906.696	4.875.101
9	2018	195,90	43,75	239,65	4.113.938	918.648	5.032.586
10	2019	202,24	44,32	246,57	4.247.139	930.757	5.177.896
11	2020	208,23	44,91	253,14	4.372.832	943.026	5.315.858

C

CALCULATION OF WASTEWATER GHG EMISSION

Table

BAU *baseline domestic wastewater in North Sumatra*

No.	Year	Waste Water	
		GHG Emission (Gg CH_4)	GHG Emission (tCO_2eq)
1	2010	39,39	827.275
2	2011	39,91	838.180
3	2012	40,44	849.228
4	2013	40,97	860.423
5	2014	41,51	871.765
6	2015	42,06	883.256
7	2016	42,61	894.899
8	2017	43,18	906.696
9	2018	43,75	918.648
10	2019	44,32	930.757
11	2020	44,91	943.026

Base on the calculation of GHG Emission of the waste water, it is concluded that baseline project of GHG Emission (Gg CH4), CH4 Emission of the waste water improve from 39,39 Gg CH4 in 2010 become 44,91 Gg CH4 in 2020

III. *SURVEY POTENTIAL OF GHG INDUSTRIAL WASTEWATER*

- **OBJECTIVE**

To create the data accuracy activity and the parameters for wastewater category of uncertainty existing data to be more accurate for the implementation of the Greenhouse Gas Inventory (emission factor survey)

- **RESULT**

- Results obtained from the survey of the determinated factor emission still under calculation or estimation which will be reference for the same type of industry in Indonesia especially in North Sumatra

NUMBER OF BIG AND MEDIUM INDUSTRY COMPANY ACCORDING TO INDUSTRIAL GROUP

	Golongan Industri *Industrial Classification*	2010	2011	2012 [e)]
	(1)	(2)	(3)	(4)
1.	Industri Makanan, Minuman dan Tembakau/ *Manufacture of Food, Beverages and Tobacco*	447	460	462
2.	Industri Tekstil, Pakaian Jadi dan Kulit/ *Manufacture of Textiles, Clothing and Leather*	54	45	45
3.	Industri Kayu, Perabot Rumahtangga/ *Manufacture of Wood, Including Furnutre*	115	117	118
4.	Industri Kertas, Percetakan dan Penerbit/ *Manufacture of Paper, Printing and Publishing*	27	30	30
5.	Industri Kimia, Batu Bara, Karet dan Plastik/ *Manufacture of Chemicals, Petroleum, Coal, Rubber and Plastics*	189	189	190
6.	Industri Barang Galian Bukan Logam Kecuali Minyak Bumi dan Batu Bara/ *Manufacture of Non Metalic, Except Petroleum and Coal*	57	56	56
7.	Industri Logam Dasar/ *Manufacture of Basic Metals*	18	12	12
8.	Industri Barang dari Logam, Mesin dan Peralatannya/ *Manufacture of Fabricated Metal Products, Machinery and Equipment*	82	59	59
9.	Industri Pengolahan Lainnya/ *Other Manufacturing Industries*	13	39	39
	Jumlah/*Total*	**1 002**	**1 007**	**1 012**

Sumber/*Source*: BPS Provinsi Sumatera Utara / BPS – *Statistics of Sumatera Utara Province*

Keterangan/*Note*: [e)] Angka perkiraan/*Estimated figure*

PT. TOBA PULP LESTARI

INLET OF PT. TOBA PULP LESTARI

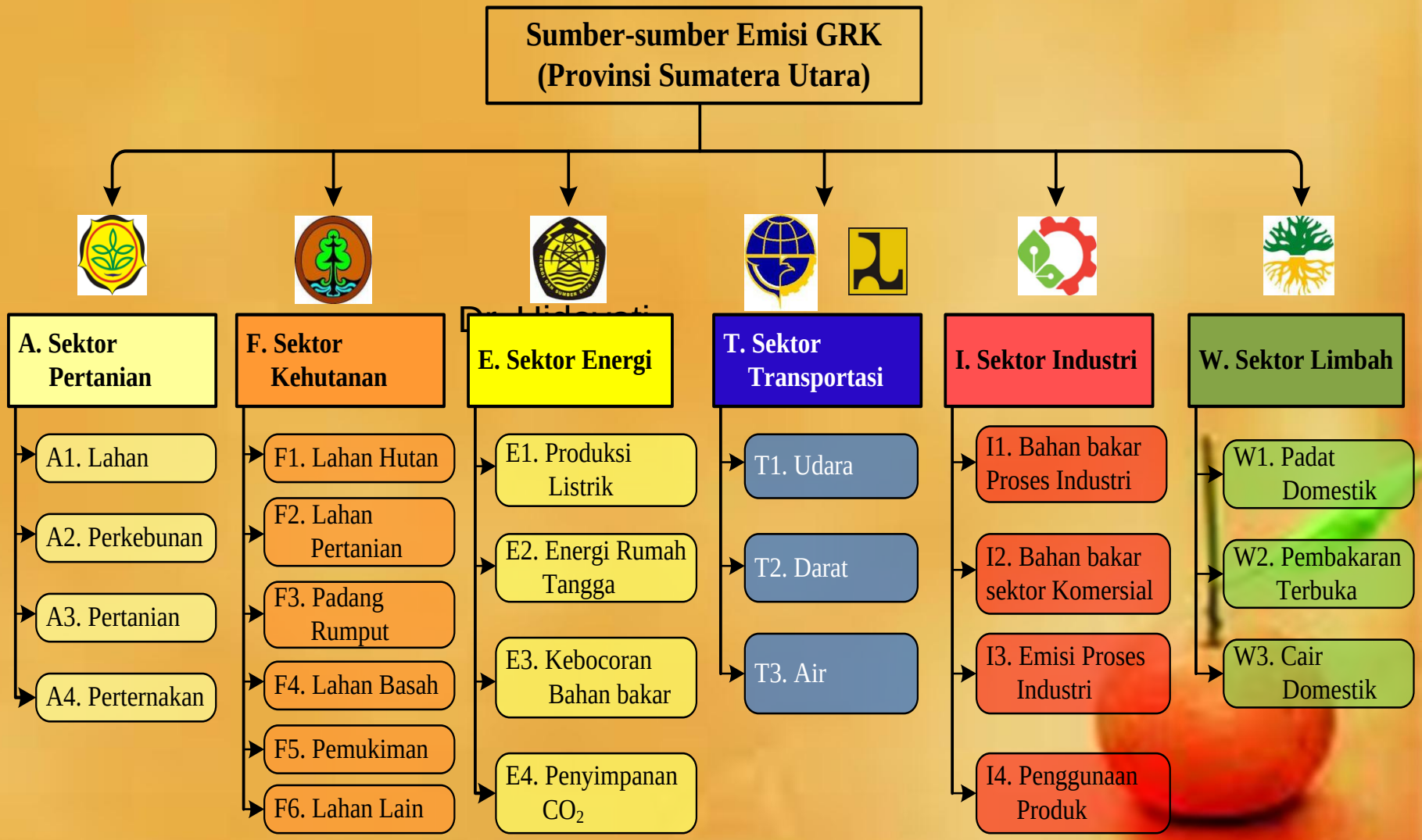
OUTLET IPAL OF PT.TOBA PULP LESTARI

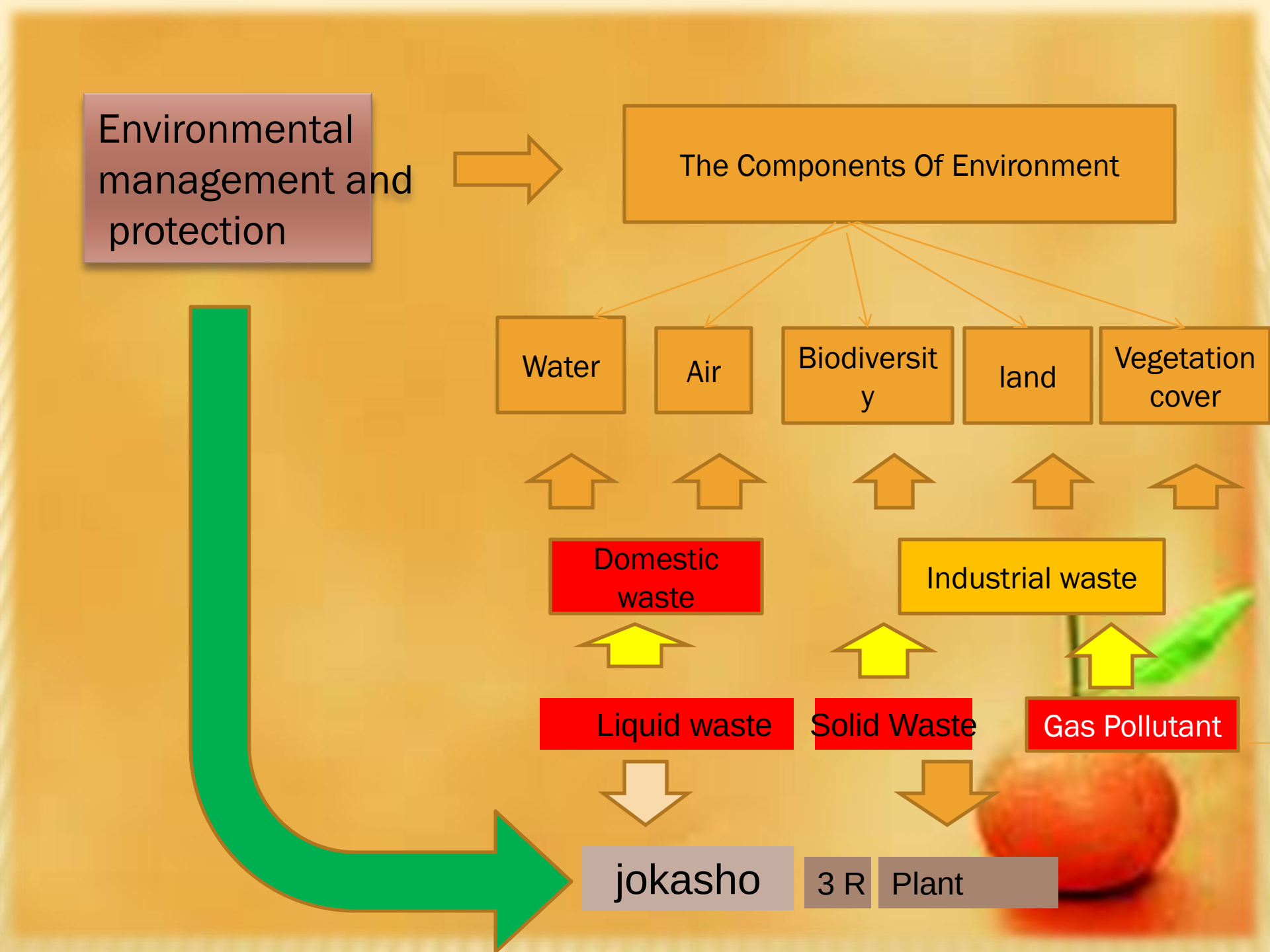
PT. PERKEBUNAN NUSANTARA IV (Persero)

INLET IPAL OF PT. PERKEBUNAN NUSANTARA IV

OUTLET IPAL OF PT. PERKEBUNAN NUSANTARA IV

Potency of JCM Project in North Sumatra



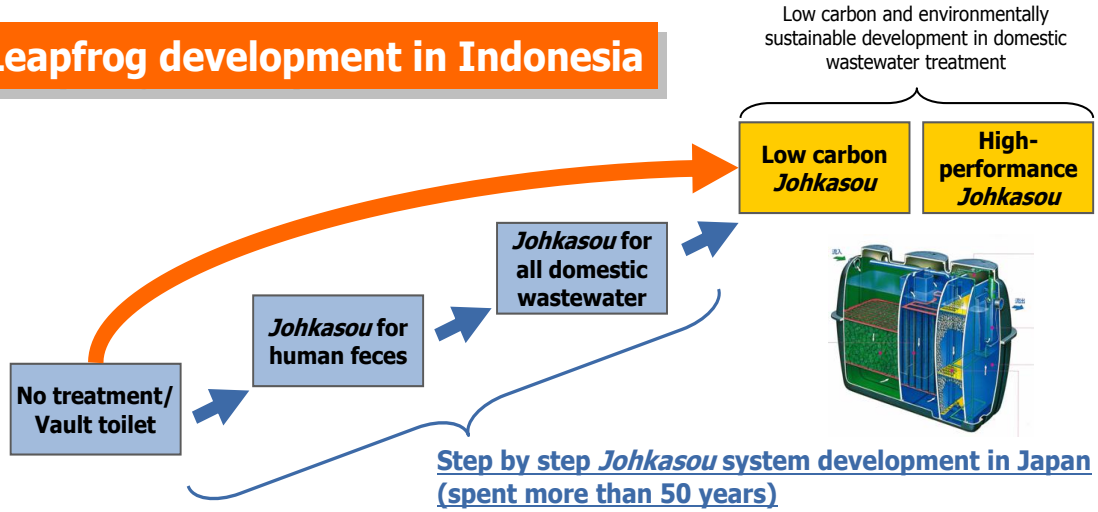

Environmental management and protection
The Components Of Environment
Water
Air
Biodiversity
land
Vegetation cover
Domestic waste
Industrial waste
Liquid waste
Solid Waste
Gas Pollutant
jokasho
3 R
Plant

V. JOHKASOU SYSTEM FOR NORTH SUMATRA

- Johkasou potential in North Sumatra (2/3)

  - As shown in previous slide, function of Johkasou is much better than septic tank. If Johkasou will be installed in North Sumatra, water environment in North Sumatra is expected to be improved significantly.

  - Also, since GHG emission from Johkasou is smaller than septic tank, installation of Johkasou can contribute to reduce GHG emission in wastewater category in North Sumatra.



1. JOHKASOU STANDARD

In Japan, Size of Johkasou is decided by the number of user of Johkasou and usage of Johkasou (by JIS A3302-2000).

Purpose		Number of targeted persons	Purpose		Number of targeted persons
Public Hall, Assembly Hall, show house, Movie Theater, entertainment hall		n = 0.08A	Shop, Market		n=0.075A
House	A≦130	n=5	Department Store		n=0.15A
	130<A	n=7	Restaurant	Usual	n=0.72A
	(2 family-house)	(n=10)		Higher potential of pollution load	n=2.94A
Apartment	※1	n = 0.05A		Lower potential of pollution load	n=0.55A
Hotel	Included wedding center or party hall	n = 0.15A	Office	Included Kitchen unit	n=0.075A
	Not included wedding center or party hall	n = 0.075A		Not Included kitchen Unit	n=0.06A

※"Number of targeted persons" is the indicator to represent the scale of Johkasou (Unit : person)

※ n :Persons, A: Dimension of each building

*1 If the "n" (Number of targeted persons) by each single family is lower than 3.5 persons, we use 3.5 persons as the value of "n" by each single family

Source: Johkasou systems association (JSA)

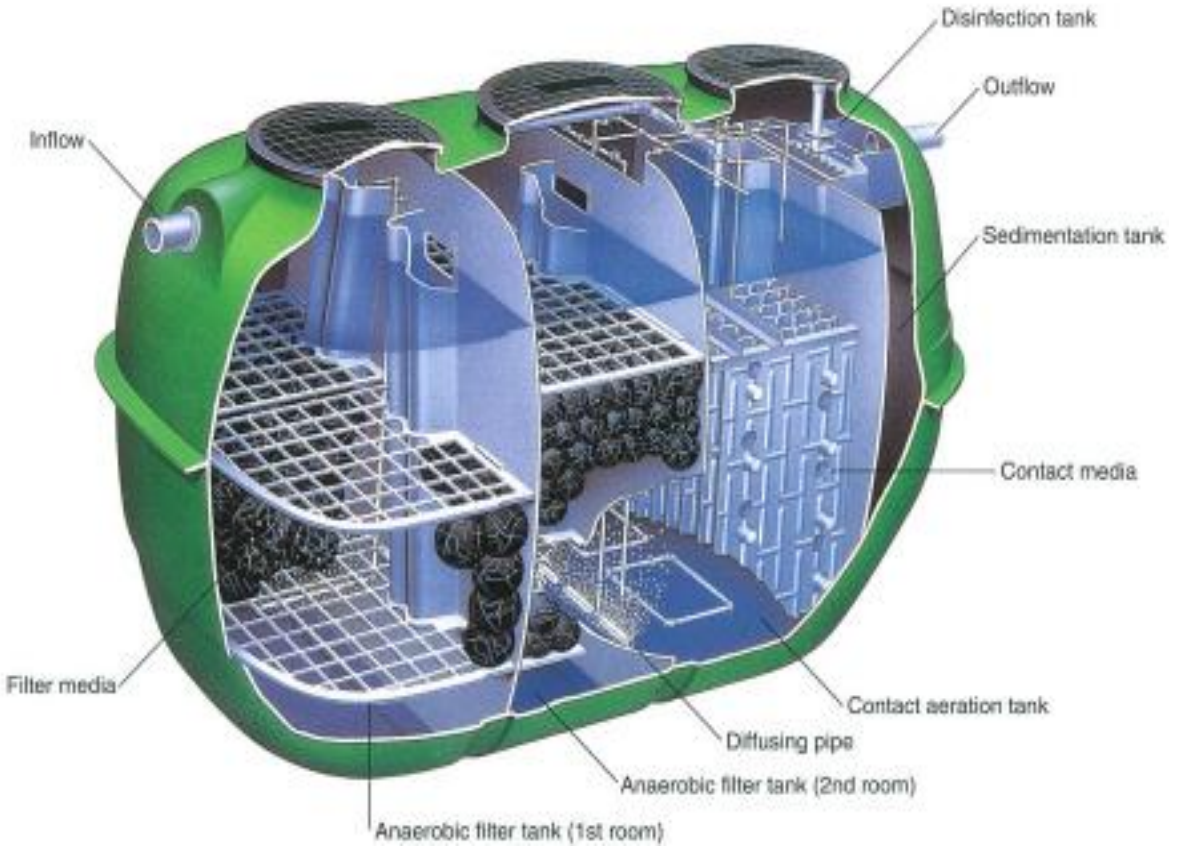
(2) SLUDGE TREATMENT

- What is the best way in North Sumatra?
  - For sludge collection and treatment, sludge collection vehicle and sludge treatment facility are necessary. Also, frequency of sludge collection, location of sludge treatment facilities and sludge treatment method (or utilization) should be considered.
  - Also, we have to consider who or which organization is responsible for sludge collection and treatment.
  - Above sludge treatment system may applicable to existing septic tank.

(3). FUNCTION OF JOHKASOU

- Contaminants in wastewater are decomposed by biological treatment.

- Anaerobic filter tank: solid matter removal, decomposition by anaerobic microorganisms
- Aeration tank: aeration by blower, decomposition by aerobic microorganisms



Source: Johkasou systems for domestic wastewater treatment 5th edition, JCEGS

Survey location : Tebing Tinggi city

- Calculate Emission factor of domestic waste water
- Johkasou Installation as the pilot project
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PRELIMINARY SURVEY FOR EMISSION FACTOR OF INDUSTRY AND DOMESTIC WASTEWATER

PROPOSAL FOR POLICY DIRECTION AND MANAGEMENT OF DOMESTIC LIQUID WASTE

I. Improvement of services access	1. Improvement/ Development of service access for communal system (Hotel, restaurant, office) 2. Improvement of service for decentralization system
2. Improvement of community's role	1. Health and education Environment 2. Improvement of community's role
3. Development of institution	1. Strengthening local agencies related with waste water supply 2. Development of cooperation among agencies 3. Strengthening of institutional field of pollution control role
4. Development of Policy and regulation	1. Arrangement of legislation (settlement, hotel, restaurant). 2. Application of the legislation 3. Diffusion/ sosialization of legislation

VI. Conclussion

1. North Sumatra effort to manage the solid and wastewater started by conducting the baseline.
2. Determining the emission of domestic waste water factor as national pilot project which is expected will be used for GHG calculation of wastewater sector.
3. Installation of johkasou in North Sumatra Province as new step of domestic wastewater management in North Sumatra.

- License, certification and standard is necessary for Johkasou installation.
- Considering necessary number of Johkasou in North Sumatra, financial support scheme from North Sumatra government is to be considered.
- JCM project is the way to support the johkasou project in NSP
- JCM Project for waste water of CPO industry can implement in NSP

Thank you