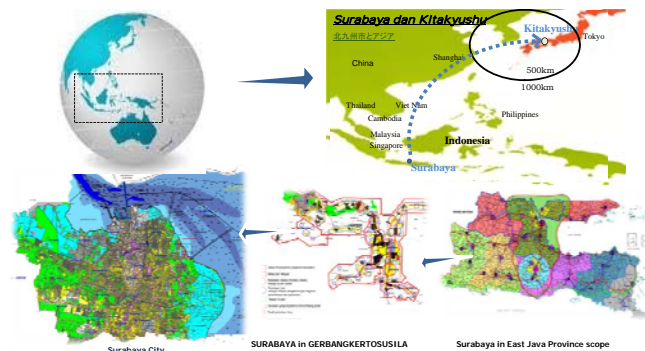


Community - Based Solid Waste Management as Best Practice In Surabaya City

by :
Ir. Tri Rismaharini
MAYOR OF SURABAYA CITY



Population = 3.055.005 people (2010)
 Total area = 33.048 Ha
 Density = 92,44 Ha/life
 District = 31 districts
 Sub district = 160 sub districts

SURABAYA CITY - INDONESIA

In national scale, Surabaya is the center of development of Eastern Indonesia area. Regionally, Surabaya is the capital and center of trades and services in East Java area.

BEST PRACTICE IN SURABAYA CITY

I. Community - Based Solid Waste Management

Community based waste management with community involvement in its management through 3R implementation

A. BASIC CONCEPT

- Reducing waste from its source: Reducing environment waste and reducing waste dumped into Landfill
- Waste sorting: between organic and inorganic waste
- Waste Treatment:
 - Organic waste processed into compost
 - Inorganic waste sold to scavenger or made into recycled products ingredients
 - Compost centre development

B. ACTIVITIES

Main activities for Community - Based Solid Waste Management Program :

- Socialization to the community (City of Surabaya in cooperation with NGO helps the community such as : Bangun Pertiwi, Pusdakota Sahabat Lingkungan etc)
- Recruitment and training of cadres
- Distribution of cleaning tools (composter bin, takakura basket, cart, and build compost centre)



IMPLEMENTATION OF 3R IN SURABAYA CITY

a. Socialization to the community

- Socialization aims to spread the understanding of the importance of 3R starting from community level
- Socializations are conducted in schools, communities (districts & sub-districts), markets and office buildings
- Socialization targets: students, communities, businessmen and workers

Counseling activities



counseling To student



Counseling to Businessman



Counseling to community



Counseling to officer

Environmental campaign



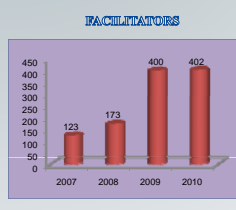
Socialization in school



IMPLEMENTATION OF 3R IN SURABAYA CITY

b. Recruitment and training of Cadre

- Environmental cadre has the responsibilities to guide their communities to conserve their own environment, especially in 3R issues.
- The environmental cadres has the responsibilities to share information and techniques of waste treatment to those who are in need.
- Facilitators are environmental cadres in sub-district level that coordinates environmental cadres.



IMPLEMENTATION OF 3R IN SURABAYA CITY

c. Distribution of Cleaning Tools

City Government of Surabaya distribute cleaning tools to help community in managing their own waste, tools given such as:

- Trash cart
to carry waste from the source into Transfer Station
- Waste shredder
to shred waste before processing in compost center
- Composter (Takakura basket, Composter bin, etc)
given for free to communities who wants to separate and process their waste
- City Government also build compost center using Government Budget. The proposals to build compost center can either come from City Government or communities with open site themselves



shredder



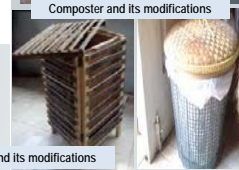
Composter and its modifications



Trash cart



Composter and its modifications



BEST PRACTICE IN SURABAYA CITY

II. Composting program

Follow up program from 3R implementation where separated organic waste processed into compost

A. BASIC CONCEPT

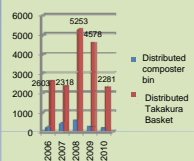
- Organic waste sorted and processed into compost
- Composting conducted in household and city scale
- In household scale composting using household scale composter
- In city scale composting using compost center, Surabaya has 15 compost centers

B. ACTIVITIES

- Distribute household scale composter for free to socialized community
- Constructing compost center through community proposal or city government initiative

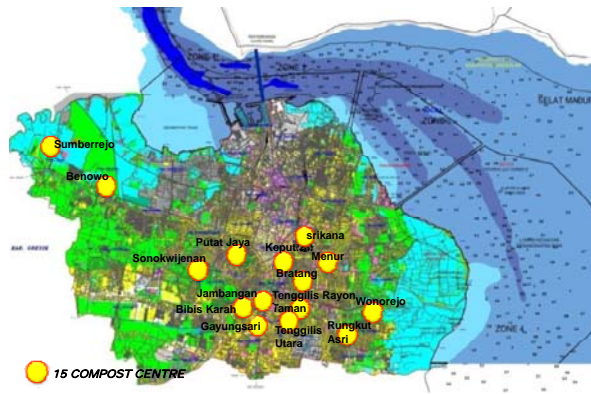


Distribution (till 2010) :
Takakura Basket reached 17.033 units
Composter bin reached 1.314 units



Efforts to reduce greenhouse gas emissions

COMPOST CENTRE DISTRIBUTION



COMPOST CENTER TRADITIONAL MARKET : KEPUTRAN



COMPOST CENTER SETTLEMENT : TENGGILIS UTARA



COMPOST CENTER BENOWO LANDFILL



COMPOST CENTER CLEANING AND LANDSCAPING DEPARTMENT OFFICE (MENUR)



COMPOST CENTER SEED GARDEN : WONOREJO

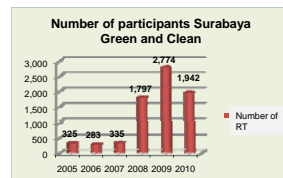


IMPLEMENTATION OF 3R IN SURABAYA

III. Reward and Punishment

- Reward given to community willing to process waste is given through Green and Clean event
- Reward to environmental cadre is given through national day awarding
- Law Enforcement through Judicial Operations

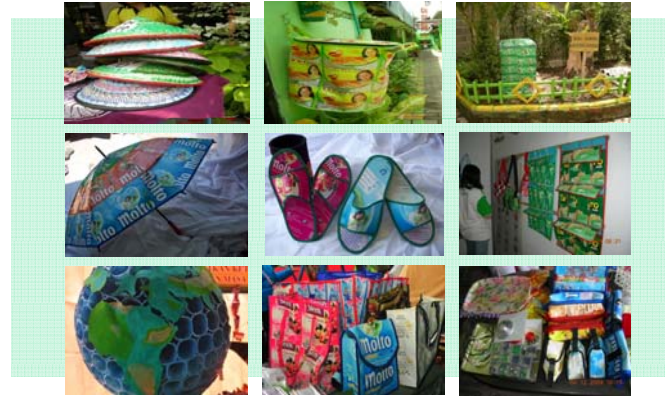
Community participation through Surabaya Green and Clean



Surabaya Green and Clean 2005-2010

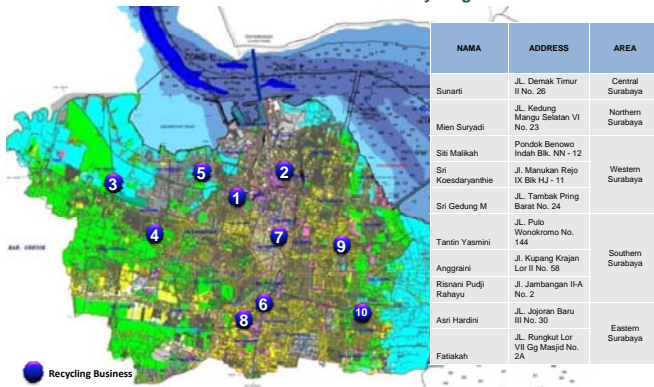


Creative recycling



IMPLEMENTATION OF 3R IN SURABAYA

Waste Recycling Business Distribution



Village Recycled Products



Sub District. Gundih, District Bubutan



Stan Rent in Modern Market

No	Name of Mall	Featur Products	Image
1	ITC Mega Grosir	<ul style="list-style-type: none"> Plastic Recycling Accessories Jilbab Bag 	
2	Jembatan Merah Plaza	<ul style="list-style-type: none"> Sandals & Shoe Cracker Snail Chips Handycraft 	
3	Royal Plaza	<ul style="list-style-type: none"> Syrup Candied Blimbing Wuluh Processed Mushrooms Crackers Veal food Place Tissue Clothes Dry Place 	

Sewa Stan Di Pasar Modern

No	Name of Mall	Featur Products	Image
4	Pasar Atom	<ul style="list-style-type: none"> Home Decoration Souvenir 	
5	Cito	<ul style="list-style-type: none"> Moslem Clothing Souvenir Accessories Dried Flowers 	

Sewa Stan Di Pasar Modern

No	Name of Mall	Featurers Products	Image
6	Darmo Trade Center	<ul style="list-style-type: none"> Accessories Clay Craft Home Decoration 	
7	Tunjungan Plaza	<ul style="list-style-type: none"> Knitting Dried Flowers 	

SOME AREAS WHICH REDUCE WASTE

NO	REGION	TOTAL HEAD OF FAMILY	WASTE VOLUME (M3/ MONTH)	
			BEFORE	AFTER
1	Rungkut Lor RW IV	1.165	65	16
2	Mojo RW XII	1.156	262	139
3	Kebunsari RW II	638	63,16	21,76
4	Wonokromo RW V	523	46,32	0
5	Komplek Kenjeran RW I	260	90	0
6	Pakis RW III	1.056	202,8	147,33
7	Karah RW V	500	58	13,34
8	Margodadi RW VII	691	178	60,25
9	Jambangan RW II	510	68	26
10	Kedung Baruk RW V	350	14,4	4,32
11	Tenggilis Mejoyo RW IV	791	420	90
12	Ketintang RW III	720	618	210,4
13	Margorukun RW X	617	186,04	65,05

I. COMMUNITY-BASED WASTE TREATMENT

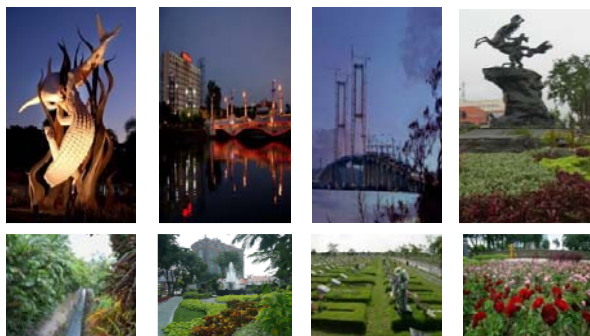
LOCATION AND ACHIEVEMENTS

NO	LOCATION	ACTIVITIES	WASTE VOLUME BEFORE PROCESSED	TOTAL WASTE REDUCTION	RESULTS
1.	Mulyorejo, Gubeng, Sukolilo, Tambaksari, Tenggilis Mejoyo, Genteng, Krembangan, Wonokromo.	Waste transportation, waste sorting, processing waste into compost, inorganic waste resale	22 – 40 m3 per Hamlet Per month	60 % inorganic waste disposed of, 30 % organic waste processed into compost remaining 10% disposed of in landfill (Final Disposal site)	Average income ± Rp. 1.500.000,00 / month
2.	Karah, Jambangan	<ul style="list-style-type: none"> waste segregation cleaning activities tree planting socialization cleaning program waste management through composter household scale 	40,6 m3 / day	<ul style="list-style-type: none"> 26,44 m3 / day reduced at the Depo Karah 1,3 m3 / day reduced by a environment cadre 12 m3 unprocessed waste disposed of in landfill (Final Disposal Site) 	<ul style="list-style-type: none"> compost 2 ton / month result sale of inorganic waste Rp. 8.000.000,00 /month
3.	Jambangan, Jambangan	Waste treatment using comunal waste composter	2,75 ton / day		Compost processing 600 kg / month

I. COMMUNITY-BASED WASTE TREATMENT

LOCATION AND ACHIEVEMENTS

NO	LOCATION	ACTIVITIES	WASTE VOLUME BEFORE PROCESSED	TOTAL WASTE REDUCTION	RESULTS
4.	Kali Rungkut	<ul style="list-style-type: none"> Organic and inorganic waste segregation Waste management training Organizers of the waste management Waste management in the environment 	1,1 ton/month	80 % reduced waste	<ul style="list-style-type: none"> Average of waste sent to landfill reduced Berowo ave rage 80% / day The less trash that littered the of environmental
5.	Komplek Kenjeran	<ul style="list-style-type: none"> Organic waste segregation Waste management training Organizer of the waste management Waste management in the environment 	1,2 ton/month	40 % reduced waste	100 people in that environment has been engaged in actively processing waste
6.	Tenggilis Mejoyo (Hamlet 01, 02,05, and 06)	<ul style="list-style-type: none"> 50% of households had to reduce organic waste using Takakura Inorganic waste collectors sold in 	2,75 ton / day	50 % reduced waste	250-300 kg of compost per month with an average additional income Rp. 250.000,-



GREEN OPEN SPACE

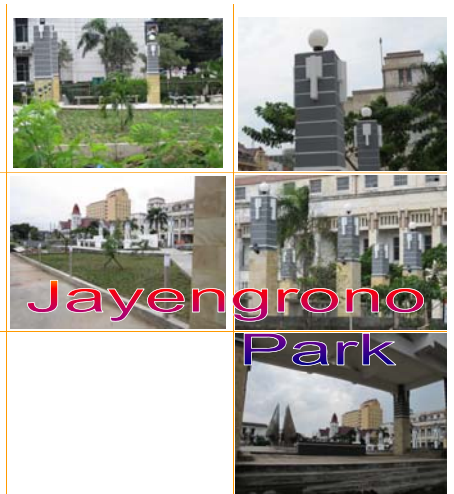




Revitalization of
Kalimas

Skate & BMX
Park

Revitalization of
Kalimas



Jayengrono
Park



Revitalization of
Kalimas

Expression
Park



Diponegoro Median



Mayangkara Park



Ronggolawe Park

Bambu Runcing Park



Bambu Runcing Park
1.a.b. Bambu Runcing Monument at noon
2. Bambu Runcing Monument at night

Prestasi Park



Ex Gas Station Park in Surabaya

No	Ex Gas Station Park
1	Jl. Jaksa Agung Suprpto
2	Jl. Dr. Soetomo – Jl. Ry. Damo
3	Jl. Dr. Soetomo – Jl. Ry. Diponegoro
4	Jl. Sikatan – Jl. Veteran
5	Jl. Undaan Kulon
6	Jl. Kombes Pol. Duryat
7	Jl. A. Yani
8	Jl. Sulawesi – Jl. Raya Gubeng
9	Jl. Indrapura – Tm. Kalongan
10	Jl. Krembangan Barat / Timur
11	Jl. Raya Gubeng – Jl. Biliton
12	Jl. Ngagel Jaya Utara – Jl. Manyar
13	Jl. Manyar Kebun Bibit

Source : DKP, Surabaya 2009

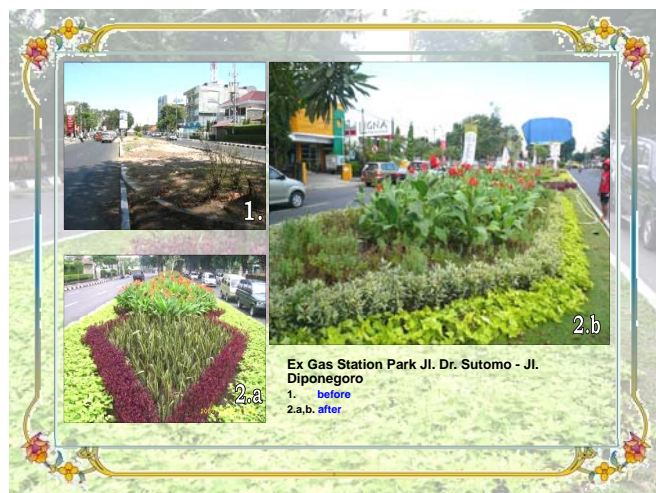


Lansia Park Ex Gas Station



Jl. Gubeng - Jl. Biliton

Park as a place of recreation, play and exercise for elder people



Median and Riverside Parks in Surabaya

No	Green Median and Rotonde
1	JH Raya Damo
2	JH Diponegoro
3	JH Yos Sudarso
4	JH JA Suprpto
5	JH MLI, Muhammad
6	JH Ampel
7	JH Lenggilis – Kendangsari
8	JH Ngindin
9	JH Ngagel Jaya Utara
10	JH Gentlengkali
11	JH Klampis Sempulu Timur
12	JH Kerlajaya-ITS
14	JH 13r. Minstopo
14	JH Dharmahusada
15	JH Mayyend Sungkono
16	JH Demak
17	JH Adilyawarman
18	JH Arjuna
19	JH Perak
20	Rotonde Timur KAS
21	Rotonde Prabeni
22	Rotonde A.Yani
23	Rotonde Depan Monumen Pers
24	Rotonde Undasan
25	Rotonde Jembatan Potokan
26	Rotonde Sulawesi



ITATS Riverside

Panjang Jiwo Riverside



Kaliwāron Riverside



Gayung Kebonsari Riverside





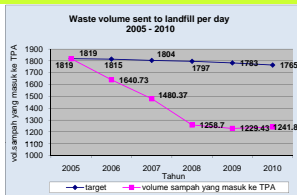
Urban Farming Agriculture



Adiwiyata School Santa Theresia



BEST PRACTICE IN SURABAYA



Key success factors :

- City Government Commitment
- Characteristics of Surabaya inhabitants for change
- Involvement of all stakeholder/partnership (community, government, private, NGO, Community Organization – PKK, mass media)

Challenge :

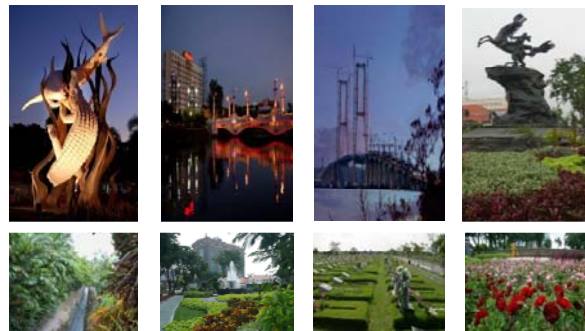
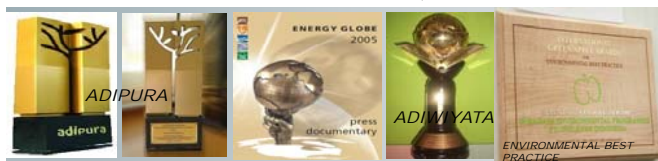
- Transforming culture/mind set

Actions :

- Sustaining socialization and program
- Incentive and disincentive
- Law enforcement

Partnership :

- People, government, NGO, Private sector, Mass Media, PKK

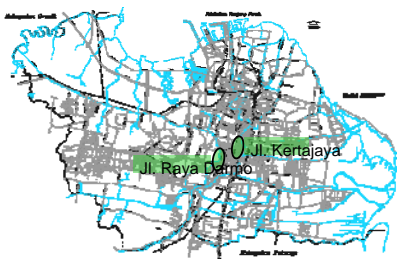


AIR QUALITY

The Effort of City Government of Surabaya to Reduce the Negative Impact of Transportation to Urban Environment

CAR FREE DAY

in surabaya



In the year 2010 Car Free Day was implemented in two location with the highest density. It was done in Sunday in Raya Darmo and Kertajaya as an effort to reduce climate change impact

The Effort of City Government of Surabaya to Reduce the Negative Impact of Transportation to Urban Environment

CAR FREE DAY

in surabaya

Car Free Day Implementation in Surabaya City Evaluation

CO2 emission savings through the car free day activities:

- Average trip length surabaya society: 13.52 km per person
- Travel by car each day: 23 people (out of 100 people)
- Distance traveled by car: 23 x 13 = 310.96 km per day (per first day by car)
- Savings vehicle trips by car: 310.96 km per day
- Fuel savings (assuming that the average fuel consumption is 1 liter per 8 km): 310.96 / 8 = 38.87 liters per day
- Emission saving (emission factor for diesel 2.6304 kg of CO2 per unit; (Source: Department for Environment, Food and Rural Affairs of United Kingdom, 2007): 38.87 x 2.6304 = 102.24 kg per day from 100 people.

Thus emissions saving (CO2) in car free day activity per day is: 1.02 kg / person.

Action Plan to be done by City Government of Surabaya:

- Refine and expand the implementation of Car free Day in Surabaya to run better and have more impact to achieve pedestrian day/non-motorized day).
- Improve services and promote public transportation.
- Improve services and infrastructure to promote pedestrian safety (Safe walking) and promote cycling (bike to work, bike to school, bike to campus, bike to shop, bike to hangout) and the development of a special cyclist lane.
- Implement Car Free Day and non motorized day held on a weekday.



The Effort of City Government of Surabaya to Reduce the Negative Impact of Transportation to Urban Environment

CO2 ABSORBING PLANTS

in Surabaya

NO	NAMA LOKAL	NAMA ILMIAH	DAYA SERAP CO2 (kg/bokor/hari)	NO	NAMA LOKAL	NAMA ILMIAH	DAYA SERAP CO2 (kg/bokor/hari)
1	Trembesi	Samanea saman	28.448,39	16	Akasia	Acacia purculiformis	48,68
2	Cassia	Cassia sp	5295,47	17	Flamboyan	Delonix regia	42,20
3	Kenanga	Canarium odoratum	756,59	18	Sawo Kecik	Manilkara kauki	36,19
4	Pinoku	Dysoxylum excelsum	720,49	19	Jatiuno	Mimusops elaeagnifolia	34,29
5	Berlinin	Ficus benjamina	535,90	20	Bunga Merak	Cassipouira pulcherrima	30,95
6	Krey Pavung	Felicium decolens	404,83	21	Sempur	Ocotea diffusa	24,24
7	Maloa	Pometia pinnata	329,76	22	Khaya	Khaya anthotheca	21,90
8	Manoni	Swedania mahaoni	295,73	23	Merbau	Intsia bijou	19,25
9	Saga	Adenanthera pavoniana	221,18	24	Akasia	Acacia mangium	15,19
10	Dundur	Lagerstroemia speciosa	160,14	25	Angsana	Pterocarpus indicus	11,12
11	Jati	Tectona grandis	135,27	26	Asam Krani	Pithecellobium dulce	8,48
12	Nangka	Artocarpus heterophyllus	126,51	27	Saputangan	Manitoba grandiflora	8,26
13	Johar	Cassia grandis	116,25	28	Dadao Merah	Erythrina crista-galli	4,55
14	Sirsak	Annona muricata	75,29	29	Rambutan	Neohelium lappaceum	2,19
15	Puspa	Schima wallichii	63,31	30	Asam	Tamarindus indica	1,49
				31	Kompas	Coomopsis excelisa	0,20

Notes:

- 1-2 : very high
- 3-5 : high
- 6-10 : medium high
- 11-16 : medium
- 17-24 : low
- 25-31 : very low

The Effort of City Government of Surabaya to Reduce the Negative Impact of Transportation to Urban Environment

CO2 ABSORBING PLANTS

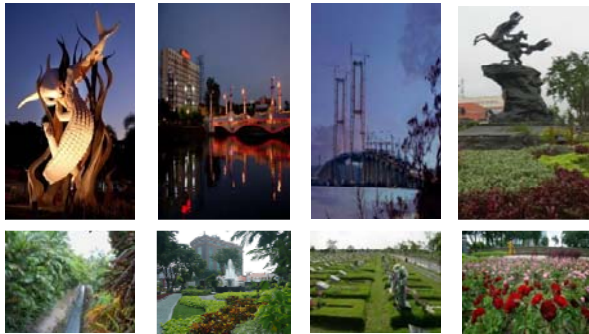
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Notes:

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- 25-31 : very low

Note : The amount of the tree planted in Surabaya is 5.267.000



WATER QUALITY

waste water treatment plant

SIMPLE WASTE WATER TREATMENT SYSTEM Neighborhood Scale

RT 07 RW-X MARGORUKUN
GUNDIH SUB-DISTRICT BUBUTAN DISTRICT

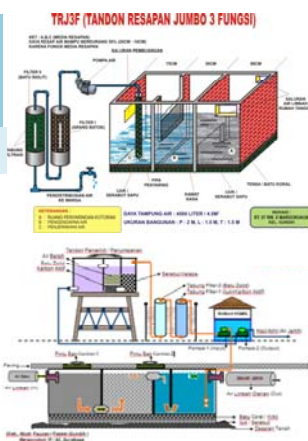
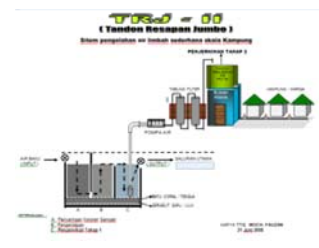
Utilizing off-site treatment system by centralized piping as a communal waste treatment facility in high population density area.



waste water treatment plant

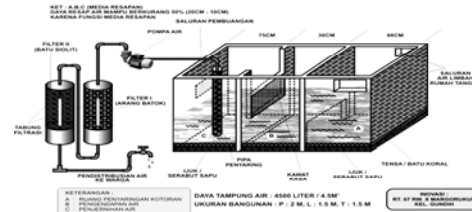
SIMPLE WASTE WATER TREATMENT SYSTEM Neighborhood Scale

RT 07 RW-X MARGORUKUN
GUNDIH SUB-DISTRICT, BUBUTAN DISTRICT

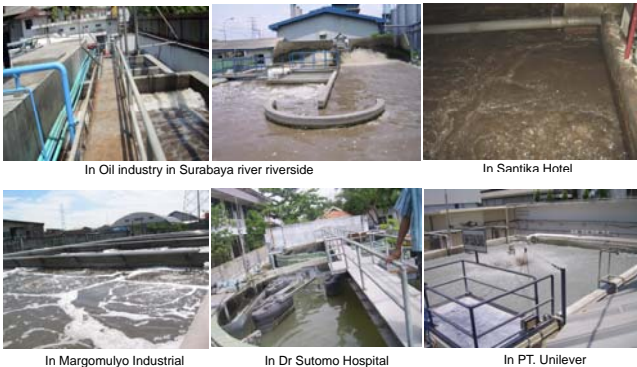


Community WWTI in Surabaya

TRJ3F (TANDON RESAPAN JUMBO 3 FUNGSI)



Industrial WWTI



In Oil industry in Surabaya river riverside

In Santika Hotel

In Margomulyo Industrial

In Dr Sutomo Hospital

In PT. Unilever

Communal WWTI



WWTI in Randu and Penjaringan Sari Flat Projects

Mangrove Wonorejo in Surabaya City



Pembibitan



Pembibitan



Silfoveshery



Track FKPM



Jogging Track



Wildlife

Thank You

