

•Project 1 : Evacuations Simulation  
- Disaster Preparedness and City Planning -

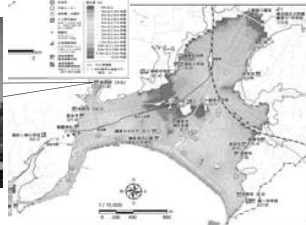


**Kamakura City, The Urgent Needs for Disaster Preparedness**

Tsunami and earthquakes occur periodically in Kamakura.



Amida Buddha, Kōtoku-in Temple



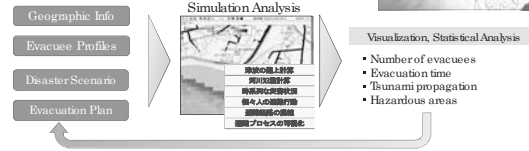
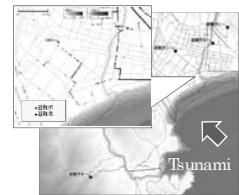
Areas vulnerable to tsunami in Kamakura (2012)

鎌倉大仏 © 2006 HASSEI-AWA Hiroaki <http://photo-hanha.hkage.net/jp/2006/03/20041127.html>

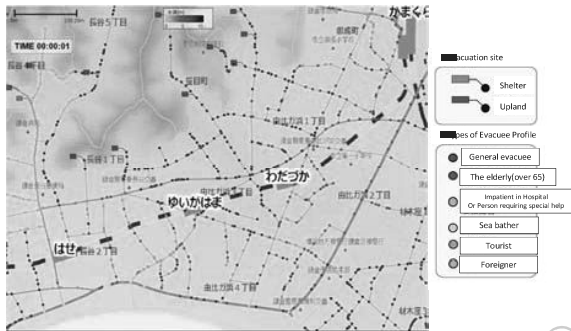
**Tsunami Evacuation Simulation for City Planning**

"Tsunami Evacuation Simulation"  
Evaluating effectiveness of disaster countermeasure plans

- Tsunami flood simulation
- Evacuation decision-making process
- Evacuee movement

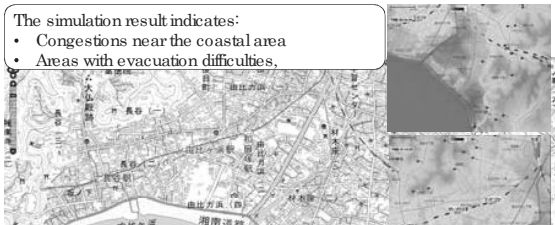


**Evacuation Simulation Example**



**Analyzing the Simulation**

The simulation result indicates:  
• Congestions near the coastal area  
• Areas with evacuation difficulties.

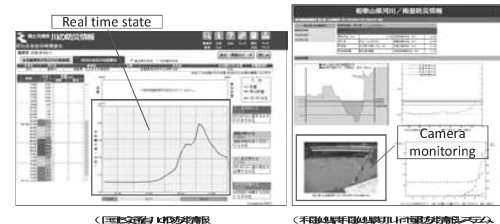


Our Engineering Consulting Approach  
• Prioritizing disaster countermeasures  
• Suggesting effective evacuation routes  
• Designing escape facilities (shelters, evacuation sign boards, etc.)  
• Planning for individuals requiring assistances

•Project 2 : Real-time river level prediction service

**Current status in Water management by local government**

- Evacuation alarm is based on real state (standard level) in people's experience
- These days alarms are often issued for precaution, citizen's evacuation actions are decreased due to the increasing of the alarm's frequency.



Flood Control Coastal Protection Geotech/Sediment Dam/Gate Observation/EWS Water Pollution

## Real-time river level prediction

Prediction in River Level **point**

Disaster Information System  
 Advance Preparation for Disaster Response Team  
 Higher Accuracy Rate for Evacuation Alarm  
 Encourage for Evacuation Action

Before  
 Camera  
 Water gauge  
 Real State River Level Camera monitoring

Disaster Reduction Information System  
 Real State River Level Camera monitoring  
 River level prediction

After  
 Date about precipitation and river level picking up  
 Calculate Prediction of river level  
 observed value  
 Prediction in the latest 6 hours after  
 → Prediction of river level in the latest 6 hours

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## Prediction of river level fluctuation

River Level Prediction of **point**

Result from collaborative research with Tokyo University AIHARA laboratory

Prediction of river level in the latest 6 hours after based on Chaos theory using machine learning

- 2017 During Torrential Rain the highest river level in observation history are observed in North Kyushu Chikugo river system Kagetsu river

Legend:  
 ● observed value  
 - - - Prediction in the latest 6 hours after

■ Result from collaborative research collaborate with Tokyo University Pro. Aihara & KKE Construction 株式会社構造計画研究所 (No.1.15) 株式会社

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## Flood area prediction Service

- Supporting focus on local government which urgent need countermeasure to monitor small-and-medium-sized river

River level prediction  
 • Catch overflow or overtopping warning before 6 hour  
 • Machine learn **point**

Flood area prediction  
 • Inundation simulation  
 • Fine mesh resolution for road and building size  
 • Correction by actual measurement **face**

Approach evacuation and rescue route  
 • Route visualization  
 • Supporting for decision-making **line**

Catch flood point  
 • Actual measurement by sensor  
 • Alarm warning **point**

➢ Reflect the situation of rainfall and flooding in real-time  
 ➢ Prepare for unexpected water disaster

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## Increase the effect of Disaster Countermeasure

Disaster Countermeasure  
 Disaster Imagination  
 Real Happened Disaster  
 expand

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- KOZO KEIKAKU ENGINEERING Inc.(JAPAN) = 株式会社構造計画研究所  
 • <https://www.kke.co.jp/en/>
- KKE SINGAPORE PTE.LTD (SINGAPORE)  
 • <https://www.kke.com.sg/>  
 • Hiroyuki SHIMODA (Mr.) / 下村 裕幸  
 • [shimoda@kke.com.sg](mailto:shimoda@kke.com.sg)  
 • Office: +65 - 6553 - 4110  
 • Address: Level 11, Marina Bay Financial Centre Tower 1  
 8 Marina Blvd, Singapore 018981

**構造計画研究所**  
 KOZO KEIKAKU ENGINEERING Inc.

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# Earthquake Sensor Alarm System

Disaster Risk Reduction 2018

Challenge Co., Ltd  
KAZUO SASAKI  
Founder and President

## Introduction of company

- ◆ Company Name : Challenge Co., Ltd.
- ◆ Company Representative : Kazuo Sasaki
- ◆ Date of Establishment : April 24, 2009
- ◆ Capital : 15 million yen
- ◆ Area of Business : Maker of disaster/security-related products as well as systems
- ◆ Products and Services :



Data center EQ guard School guard  
Headquarters : 2-14-4, Kojima, Taito-ku, Tokyo, JAPAN, 111-0056  
TEL 81-3-5809-2304 FAX 81-3-5809-2305  
<http://www.challengego.co.jp>

## Earthquake Sensor Alarm System (ESAS)

- ◆ When Earthquake occurs, people needs to evacuate immediately.
- ◆ Nuclear plants, chemical plants and trains must be shut down.

Seconds extra warning can be the difference between life and death  
80% of deaths could be prevented by early and accurate alarms



EQ guard has sensor inside  
It detects initial small vibration (P wave) and issue alarm immediately before big shaking (S wave) arrives. So, people can evacuate before strong shaking starts.

### Specifications

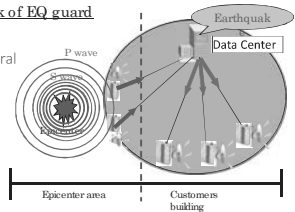
Item	EQGuard #	Transmit method	Spk. VOXABLE-TV
Display	PC display	Operational facilities	See manual, user interface
Warning level	5.1 gtl	Power	DC5V
ETA	PC display or 400 Hz. (8000 Hz per sec. data)	External/Intr.	18L7A/180ASLS
Warning display	LED flash display	Weight	Approx. 11 g
Audio/Video output	Line output, Headphone, Music, Voice output	Environment	Temp. -10°C~+55°C, Humidity 10%~90%
Warning output	Logic output, Relay	Facilities	Relay, Power adapter

- > Real-time display of the seismic intensity of each observation point on the map
- > Control signals of EQ guard can be issued to shut down chemical plants, nuclear facilities etc. beforehand.
- > Customers Japar: 1000  
Indonesia, Korea, Turkey, Romania, Armenia

## The benefit of this system for DRR

### ◆ Early warning system based on network of EQ guard

1. EQ guard can work as a stand alone, and also can work as a local network with several installations.



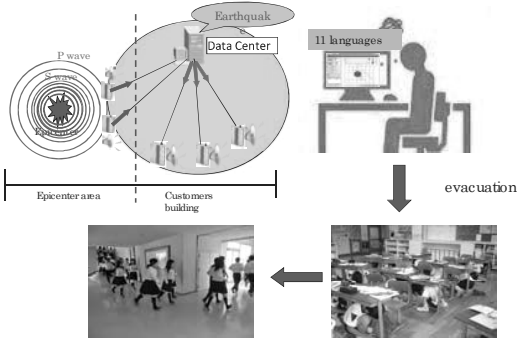
2. It is possible to construct a regional earthquake alarm system by making NW of EQ guard.

3. This system works without nation-wide dense seismometer network

### ◆ Contribution to global targets

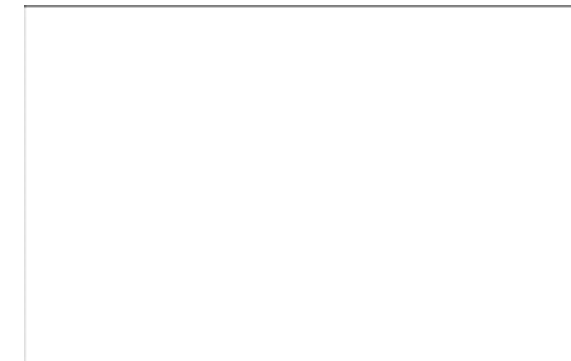
- Reduce fatalities and injured people by the Earthquake Sensor Alarm System (ESAS)
  - Increase introduction countries and target people by establishing ESAS in each country
- ### ◆ Contribution to SDGs
- Rectify inequality, and ensure the safety of all people by Introduction of ESAS.
  - Establish resilient infrastructure by ESAS

## The benefit of EQ guard



80% of deaths could be prevented by early and accurate alarms.

## The Drill video of EQ guard



## The targeted customers

- Government and Local Government
- School, Company, Factory, Hotel and Apartment
- Construction Company, Maintenance Company and Insurance Company

Examples of customers  
1,000 sets installed.

Japar



Schools, kindergarten, nursery,  
Nursing home etc  
Indonesia: Yogyakarta, Aceh  
Korea: Seoul  
Turkey, Romania, Armenia

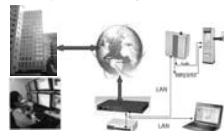


Patent : Acquired (No.5373435)  
Launch : 2012

Japan

## Business Model

### 1. System configuration and Cost



Initial cost	
● Device (Sensor)	3000US\$
● Installation	800US\$
Running cost	
● Data center Service	50US\$/month

### 2. System operation

- EQ guard send observation data to data center when earthquake occur.
- Data center collect data and send signal to EQ guard
- EQ guard issues Alarm

The distribution server of the data center and each EQ guard are constantly communicating and monitoring the state.

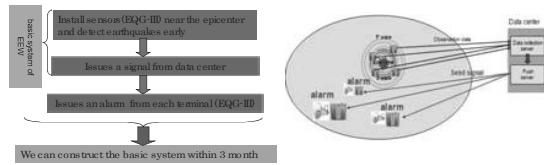
## Basic System of Earthquake Early Warning

Provide earthquake detection and signaling service to any country in the world to provide safe living one city in requesting country"

Select area for construction of earthquake sensor alarm system.

Find 10 buildings for installing device near the epicenter

These buildings are necessary of facility of internet and power



## End

Thank you!

URL: <http://www.challenge.co.jp>



- Introduction of long-distance transmission speakers and examples of adoption
- TOA Measures for disaster prevention projects

PT.TOA GALVA PRIMA KARYA  
TOA Corporation



### Outdoor Speaker challenges ②

#### The volume goes down with cover

Sounds cannot be transmitted through buildings and mountains, so the sound of outdoor speakers may not be heard at all



Sounds of outdoor speakers are masked by a crowded sound or a vehicle passing sound



Sounds of outdoor speakers are drowned because the noise level is very high along crowded places and roads with heavy traffic

### Long distance transmission Type speaker Product Lineup

**Horn Array Speaker**  
(8Units type,4Units type)

**Medium Horn Array Speaker**  
(4Units type,6Units type)

**Slim speaker for disaster prevention**  
(1Unit and 2Units stack)



4Units (600 - 700m)  
8Units (800 - 1,000m)



Can be installed in steel pipe column for disaster prevention Radio (released in July,2018 )  
4Units (500 - 700m)  
6Units (700 - 900m)

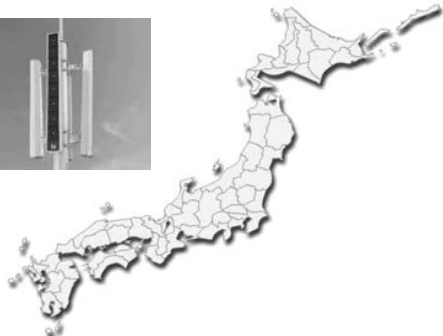


Can be installed in steel pipe column for disaster prevention Radio (60w/50w/30w switchable)  
1Unit (400 - 600m)  
2Units (600 - 800m)

\* Distances vary greatly depending on the installation environment

### Slim Speaker Adoption results (nationwide)

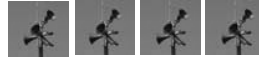
Total number of installations = about 10,000 sets (As of March 2018)



### Outdoor Speaker challenges ①

#### It's ringing but I can't hear

If a large number of speakers are installed in a narrow range, sound congestion or troll sounds  
What are you talking about? Don't know.  
Moreover, the clarity is deteriorated when "reflected sound" from the building and the mountain overlaps.



The far performance of general outdoor speakers is about 300m

#### It's too noisy.



The house near the place where the outdoor loudspeaker is installed annoyingly oppositely and the broadcast content is not heard in a distant house

### TOA Technology (Horn array speaker)

The next high performance of the sound Generation type Disaster prevention Speaker

- 2 to 3 times farther performance of conventional speaker
- and clearly in the distance

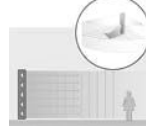


#### Traditional speakers



If the distance doubles the volume is 1/4

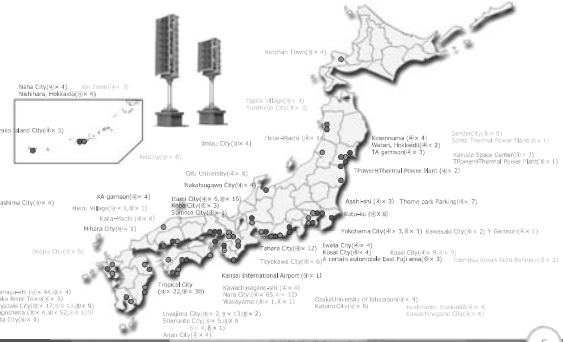
#### Horn Array Speaker



Even if the distance doubles the volume is 1/2

### Horn Array Speaker Adoption results (nationwide)

Total number of installations = about 826 sets (As of March 2018)



TOA's management philosophy is to "sell sounds rather than equipment"

What customers are really looking for is...

Not a speaker, but a clear sound

"Clear sound" = By transmitting "correct disaster information" to as many people as possible, we can save precious lives.

TOA Corporation aims to be a company that can contribute to society by providing clear sound and saving as much human lives as possible.

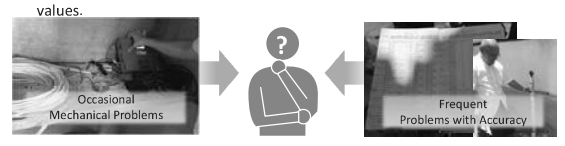


<http://www.toa.co.id/>

TOA Smiles for the Public

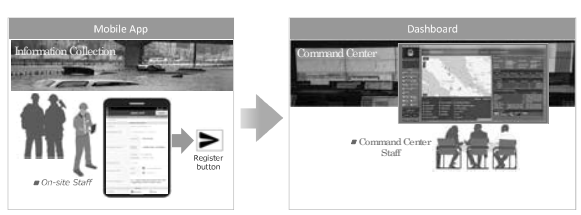


- In some actual cases
  - Data collection by sensors do not work due to mechanical problems.
  - Manual data collection has problems with accuracy in terms of time and values.



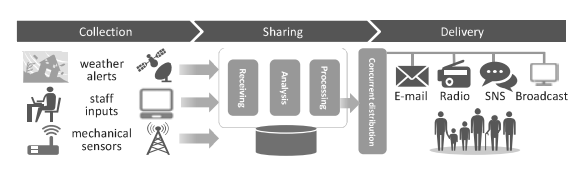
- What should Fujitsu do to make collection tools locally acceptable?

- A user-friendly mobile application integrated with the local operations. (Case Study in North Sumatra)

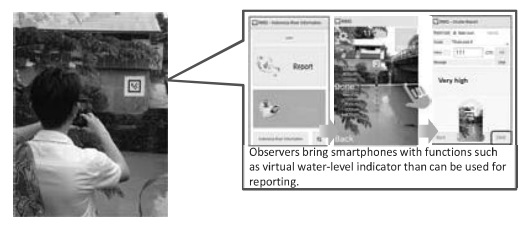


Fujitsu always applies technologies based on situations in each area.

- Disaster management is effectively supported by ICT.
  - Disaster information is COLLECTED from staff and sensors to grasp situations.
  - The information is SHARED among staffs and agencies for disaster responses.
  - The information is widely DELIVERED to citizens via multimedia distribution.



- Latest technologies such as AR are integrated with local operations. (Case Study in Manado)



Observers bring smartphones with functions such as virtual water-level indicator than can be used for reporting.

Fujitsu always applies technologies based on situations in each area.



Company's Profile



Midori Engineering Laboratory (MEL) Co., Ltd.

Since 2004 – Sapporo, Hokkaido, Japan Tokyo division

SESAME System operating service and system integrator



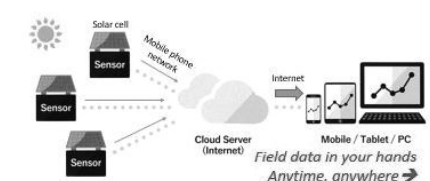
I came here, Indonesia from 2009



2015.8

What is SESAME System?

Sensory data transmission service assisted by Midori Engineering Lab.



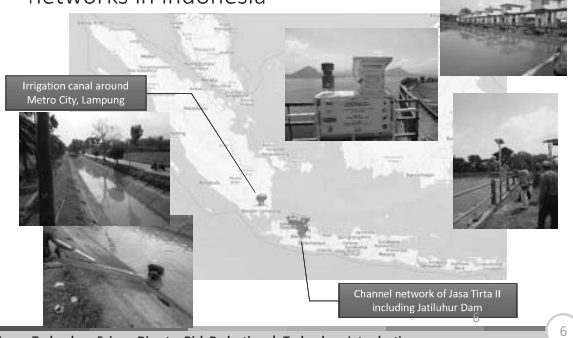
A simple, maintenance-efficient solution for continuous field data monitoring

Field data in your hands Anytime, anywhere Observation and EWS

SESAME system in INDONESIA.....

- Operating of Indonesian peatland semi-real time monitoring system. **50sets** (ground water level, rainfall, soil moisture, etc.)
- Operating of PJT2 (water management company in Indonesia) semi-real time water management system **50sets**
- Operating Weyskampong Indonesia agricultural canal management system **7sets**
- in Japan and another country, early warning system cheking River water level **100sets**

SESAME is actually used in two large canal networks in Indonesia



At PJT2 50 SESAMEs, from 2015 October



PJT2's SESAME weather station, water quality, water level (pumping station)

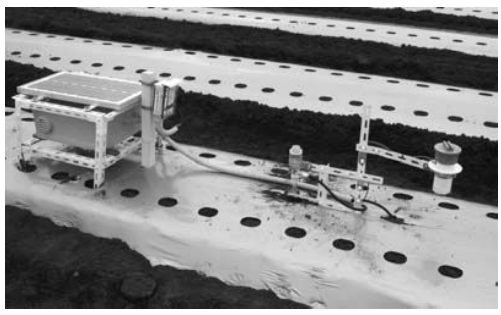
SESAME in Irrigation canal & Peatland

at Lampung & Palangkaraya



at Jambi

On Radish Farm in Hokkaido Japan ,  
PF(soil moisture), temperature, humidity, camera

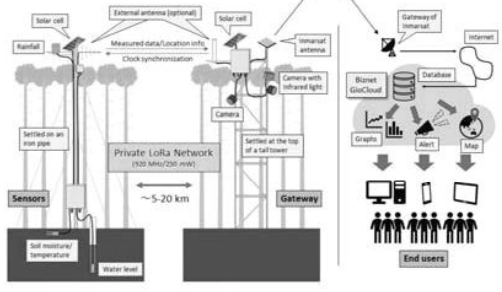


# New Brand SESAME III system at out of mobile phone aria

at Rice field ,for getting close temperature & humidity  
in Hokkaido Japan



## SESAME 3 System -Outline-



One, Sample stettered in Indonesia  
**SESAME III (Real Time Monitoring System)**  
(Sensory Data Transmission Service Assisted by Midori Engineering)

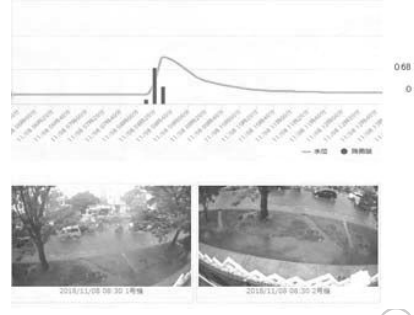


How to see the data.....  
It is SESAME-WEB system !!!



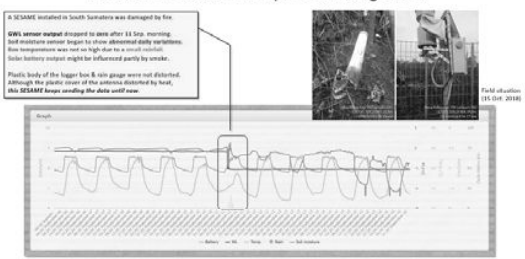


## From Makassar



## Sesame is very TOUPH

Burnt SESAME keeps sending data



## Summary – What is **SESAME**?

- ◎ A simple, maintenance-efficient solution for continuous water management
  - Near real time data acquisition based on mobile phone network (or satellite)
  - Various sensors powered by solar energy
  - Easy operation & secure data storage provided by the cloud server & web-based system



Flood Control Coastal Protection Geotech/Sediment Dam/Gate Observation/EWS Water Pollution

# Rehabilitation of Rubber Dam™

## Seismic Proven Technology

6<sup>th</sup> December 2018



Rubber Dam


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# RD terhadap Bencana Alam

日本自動機工株式会社 NIPPON JIDO-KIKO CO., LTD.

Tidak pernah adanya malfungsi atau kerusakan pada lebih dari 1500 Rubber Dam™ di Jepang yang di sebabkan oleh bencana alam.



2011 East Japan Disaster



Narase Rubber Dam™

Terdapat kerusakan pada bagian beton tetapi tidak ada malfungsi pada Rubber Dam™

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# Sebelum Rehabilitasi

日本自動機工株式会社 NIPPON JIDO-KIKO CO., LTD.



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# Proses rehabilitasi Rambatan

日本自動機工株式会社 NIPPON JIDO-KIKO CO., LTD.





Kisdam Pembongkaran Rehabilitasi Pondasi





Instalasi Baut Pemasangan Karet Selesai

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# Setelah Rehabilitasi

日本自動機工株式会社 NIPPON JIDO-KIKO CO., LTD.



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# Pengenalan NJK

日本自動機工株式会社 NIPPON JIDO-KIKO CO., LTD.

- 1956, Inverton Amerika menciptakan Rubber Dam.
- 1964 "Nippon Jido-Kiko Co.,Ltd.(NJK)" membuat Rubberdam™ untuk pertama kalinya di Jepang.
- Pada 1979, Bridgestone bermitra dengan NJK mengembangkan Rubberdam™ jenis buku. (NJK di Jepang, dan Bridgestone bertanggung jawab di luar negeri)
- Sejak tahun 1980-an, Bridgestone melakukan ekspansi ke luar negeri dan mulai menempati pangsa 80%, tetapi mengundurkan diri dari bisnis pada tahun 2008.
- Mulai tahun 2010, produk awal yang telah dipasang akan berada dalam periode pembaruan, dan pembaruan produk Bridgestone juga dilakukan sebagian.
- Menanggapi permintaan dari luar negeri pada tahun 2015, kami mulai mempertimbangkan apakah akan memperluas pangsa ke luar negeri, dengan memasukan para ahli dari Bridgestone.

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# Pengenalan Rehabilitasi

日本自動機工株式会社 NIPPON JIDO-KIKO CO., LTD.

## Langkah dari Proyek

- 2015, FS dilakukan untuk memahami situasi terbaru.
- 2016, "Survei Investigasi Proyek" dilaksanakan di Indonesia.
- Pada tahun 2017, dipilihlah Rambatan sebagai proyek rehabilitasi

## Ringkasan Proyek

- 25 dari 50 adalah produk Jepang, setengahnya diganti oleh Produk Tiongkok dalam beberapa tahun terakhir, dan 80% dibuat di Tiongkok.
- Lifespan rata-rata yang dibuat oleh Jepang adalah 15 tahun atau lebih, sedangkan yang dibuat oleh Tiongkok adalah sekitar 5 tahun.



Rambatan Rubber Dam™

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# Tabel ringkasan hasil survei Rubber Dam™

日本自動機工株式会社 NIPPON JIDO-KIKO CO., LTD.



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## *TERIMA KASIH*



Japan Site



English Site

URL <http://www.jido-kiko.co.jp/>  
TEL (+81)048-835-6361  
E-mail [info@jido-kiko.co.jp](mailto:info@jido-kiko.co.jp)



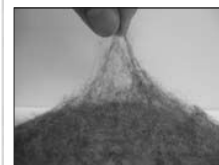
緑・土・水

## Takino Filter Inc.

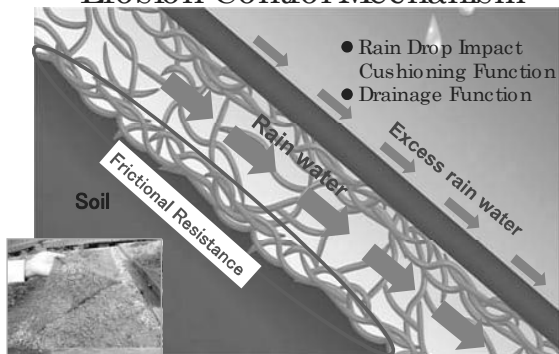
## Takino Filter - Erosion Control Mat -



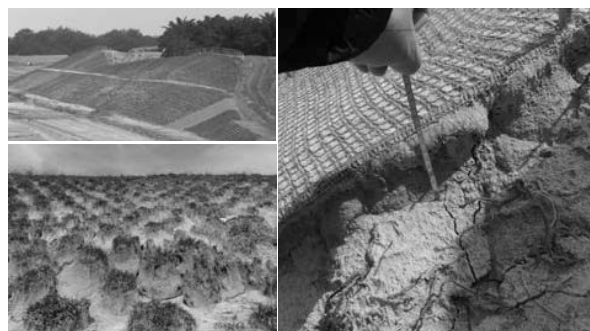
Takino Filter is a non-woven polyester mat consisting three dimensionally formed fibers and having approx. 98% porosity.



## Erosion Control Mechanism



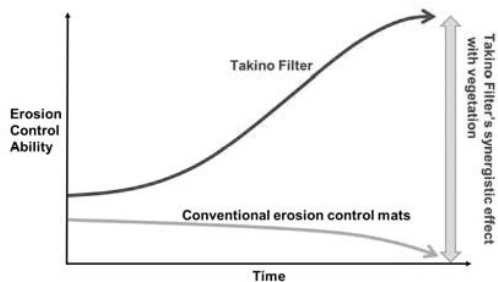
## Erosion Control Performance



## Case: Mountain Slope Restoration from Large Scale Landslide



## Erosion Control Ability with Time



Takino Filter's erosion control ability will increase as time goes by due to its vegetation inducing function.

We would like to show you  
Takino Filter more in detail.  
See you at our booth!





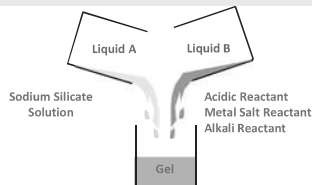
# TOSO SANGYO Co., Ltd.

東曹産業株式会社

## Definition of "Chemical Grouting Method"

Chemical Grouting Method is a method in which injected chemical permeates pore spaces in granular soils and solidifies it.

Fundamental action



The mixture of Liquid (A) and Liquid (B) becomes gel in the designed time span

## Proposed Technology

● Materials with stable quality, performance, and safety

● Suitable technology for various soil and purposes

● Proper construction management method

## Safety issues

▶ There is anxiety regarding to the chemical material, two accidents were recorded by the use of chemical Acrylamide in Japan (1974) and Indonesia (1975)



▶ Dangerous types of chemical in chemical grouting is forbidden to use due to its toxicity, 150 to 413 mg/kg (According to ATSDR).

▶ The verification of safety and effect was confirmed by ITB.

## JICA PROJECT

### VERIFICATION SURVEY WITH THE PRIVATE SECTOR FOR DISSEMINATING JAPANESE TECHNOLOGIES FOR GROUND IMPROVEMENT USING CHEMICAL GROUT TECHNOLOGY

— About "CHEMICAL GROUTING TECHNOLOGY" —

TOSO SANGYO Co., Ltd.

Dec 6, 2018

## Mechanism of "Chemical Grouting Method"

There are 2 forms for Chemical Grouting.

### Penetration Grouting

(Sandy Soil)

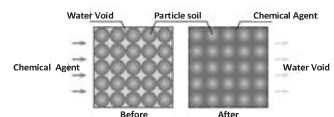


### Fracture Grouting

(Cohesive Soil)



Chemical Agent penetrated into the void of the soil particle, soil strength increased by removing interstitial water, to bond the soil particle and to improve the water-stopping.



A phenomenon in which chemical agent is injected into the veins, homo gel strength (hardening strength of Chemical Agent) after hardening to form amount of large Chemical Agent fraction branch in the soil, to increasing strength of composite soil.



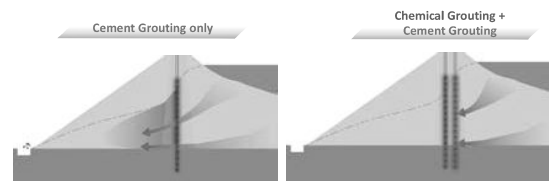
## Verification summary in JICA Project

Conduct 3 step test to verify Safety and Effectiveness

	Step1	Step2	Step3
Verification category	"Effectiveness and Safety" verification		"Field construction" verification
Test scale	Table test	Bench scale test	Dam site test
Test site	Japan	Indonesia	Indonesia
Person in charge	Kyushu University	Institute Technology Bandung (ITB)	PT. NITTO CONSTRUCTION
Effect Verification	Strength Permeability Coefficient	Effect using Indonesian sand	Verification through the actual site
Safety Verification	De-test components	De-test components using Indonesian sand	Verification through the actual site
			Permeability Coefficient
			pH

## Effectiveness of Stopping Seepage by Chemical Grouting

Dam Site Test (Step 3) to be conducted with Cement Grouting which aims to verify the effectiveness under practical conditions.



The injected cement is flown away before it solidifies because Cement Grouting requires longer time to solidify.

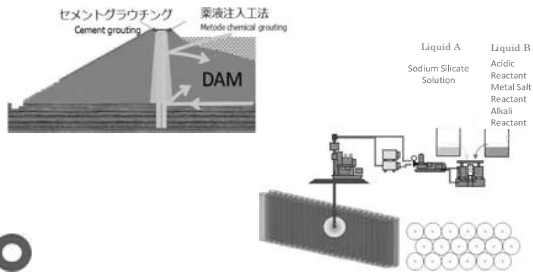
Building the stopping water wall by conducting Chemical Grouting before Cement Grouting makes Cement Grouting function more effective and get the highly stopping-water effectiveness.

\*note : application will be in natural DAM

### Chemical Grouting as Auxiliary Method

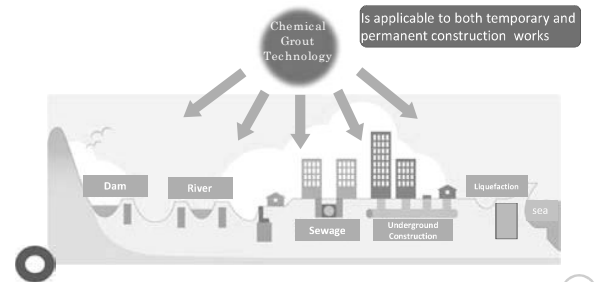
Restoration of DAM to its original function by stopping seepage

STEP 2 : Cement grouting → ensure the long-term durability  
 STEP 1 : Chemical grouting method → Ensure water stoppage



### Application to Chemical Grout Technology

Besides the application to Water-leaking Dams and others, Chemical Grout Technology can be used to the urban development.



### Potential Users in Indonesia

Chemical Grouting can be effective at the constructions in Urban Development (Map for construction plan).

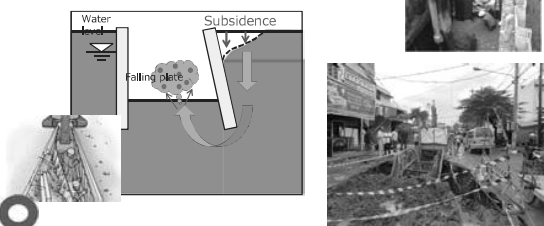


### Major Issues in Urban Development

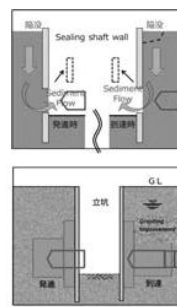
- ✓ During execution of construction works, there are several challenges; water drainage due to excessive loads and vibration, failure of infrastructures due to soft/loose soil.
- ✓ For example in tunnel construction, risk such as sediment/water flooding, heaving etc. might disturb the construction.
- ✓ The liquefaction caused by the earthquake that results in collapse of infrastructures and structures.

### Sediment disaster

During execution of construction works, there are several threat such as deformation of surrounding grounds, and drainage of groundwater results in failure of ground surface and structures.



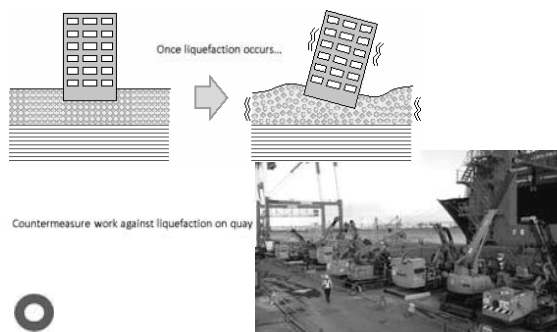
Chemical grouting is a perfect method to countermeasure construction problems.



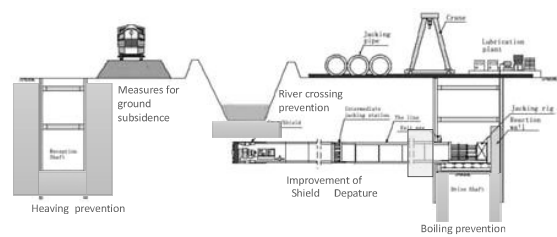
Application for the wall protection on pipe jacking  
 Since chemical grouting, pore wall become stable.



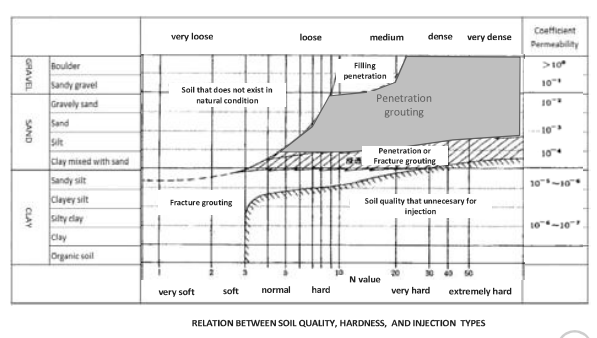
### The liquefaction phenomenon



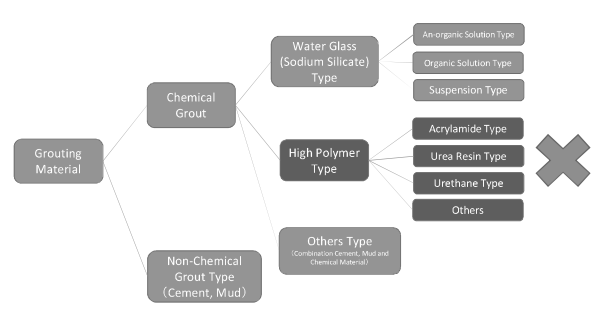
### Subway and sewage tunnel construction Soil reinforcement and water stopping of shaft and wall barrier



### Application of Chemical Grouting in Various Types of Soil



### Types of Grouting in Japan



### Chemical Grouting Types

Source: 2003, Department of the Army U.S. Army Corps of Engineers Washington, DC.

Type	Property						
	Penetration in Ground Units	Durability	Ease of Application	Potential Toxicity	Flammability of Materials	Relative Costs	
Portland-cement-based grouts	L	H	M	L	N	L	
Silicates	H	M	H	L	N	L	
Acrylates	H	M	H	M	L	H	
Lignins	H	M	H	H	L	H	
Urethanes	M	H	M	H	H	H	
Resins	L	H	M	H	M	H	

\* N = non-flammable; L = low; M = moderate; H = high.

### Sodium Silicate Uses

**Detergent, Soap etc.**  
(Na<sub>2</sub>O for washing and whitening)  
Using for washing, whitening, water softener, and buffering, and widely used as soap additional material.  
Number 1 silicic acid soda

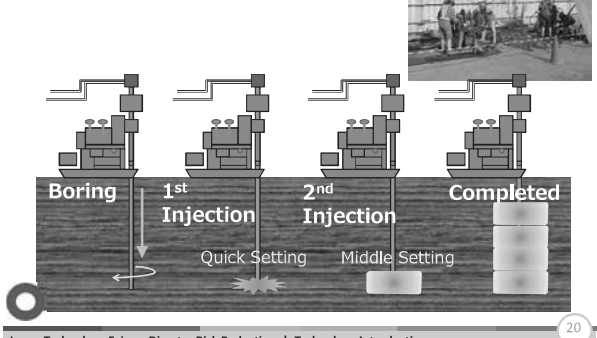
**Casting**  
(SiO<sub>2</sub> for adhesion)  
Using for sand casting as aggregate for concrete mix, but using also to bond sand become solid. Reacted by the present of carbon dioxide.  
Number 2 silicic acid soda

**Engineering work**  
(SiO<sub>2</sub> for solidifying and reinforcement)  
Using for chemical grouting material or instant solidified concrete for soil improvement.  
Number 3 silicic acid soda

**Paper and paper pulp**  
Using for material that stabilizes hydrogen peroxide when removing ink on waste paper or bleaching paper or pulp.  
Number 3 silicic acid soda

**Silica Source**  
Using for silica gel layer material or silica coating material for preventing ink on side amount of thin paper by using chemical decomposition.  
Number 3 silicic acid soda

### Construction procedures of Chemical Grouting Method



### Advantages of Chemical Grouting

- Stopping Seepage and Strengthening the ground**  
Permeates through granular pores of the soil particle and increase in efficiency of the water-stopping with soil strength, C=80KN/m<sup>2</sup>
- Flexible method**

Purpose	Application	Ingredient
Auxiliary Method	Protection of Defective Part of Earth Retaining Wall	Sodium Silicate and Hardening agent
Main Method	STRUCTURE FOUNDATION	Specific Grade of Sodium Silicate and Hardening agent
- Limited Duration Effect**  
The effect about stopping-water vanishes within few years because of Fluton of silica component.  
1) The effect vanishes when the improvement ground is deformed by the vibration due to external load.  
2) The effect remains consistent for more than few years if the applied chemical agent is in good condition.
- Easiness of Construction**  
Using small machine. Can stop the water temporarily and maximize the effect of cement grouting

Thank you for your kind attention!  
"Terima kasih"

## Japan Technology Fair on DRR

Technology Introduction  
from  
Japanese Companies

### Hitz Gates and penstock



#### Achievement-----Japan and Overseas

Gates: 570(21) projects

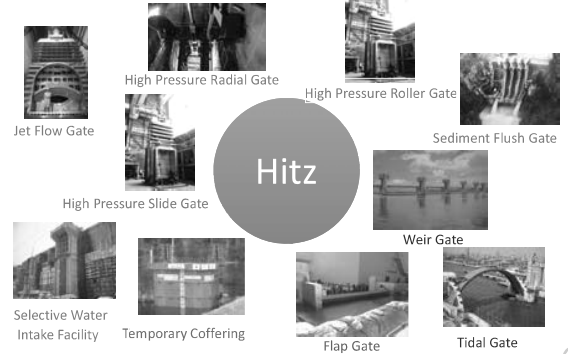
Name	Location	Description	Year
Ham Thuan Hydropower project	Vietnam	Supply and erection of gates and penstock	2001
Da Nhim P/S Rehabilitation Project	Vietnam	Rehabilitation and replacement of gate and penstock equipments	2006
Improvement Project of Existing Facilities of Shihmen Dam	Taiwan	Wye Type Bifurcation	2013
East Side of Pasak River Flood Prevention Project	Thailand	Supply and erection of Stainless gates	2015
Nam Ngum 1 Hydropower Station Expansion project	Laos	Supply and erection of gates and penstock and temporary coffering (Redevelopment of Dam)	Under Construction



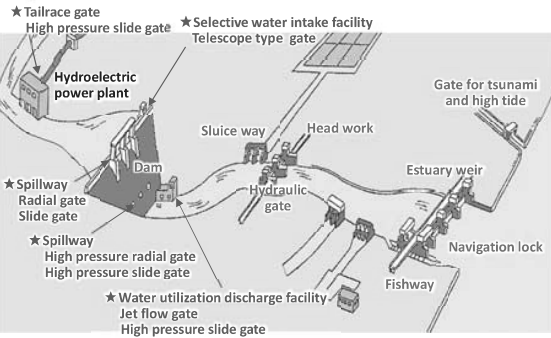
### Introduction-----Hitz Gates

- Since 1924, Hitachi Zosen has been designing, manufacturing and installing Hydraulic gates.
- Hitachi Zosen's Hydraulic gates enjoy a high reputation from our customers for comprehensive technical capabilities.
- Hitachi Zosen have brilliant delivery experiences, engineering techniques and manufacturing skills, so we meet the expectations of customers.

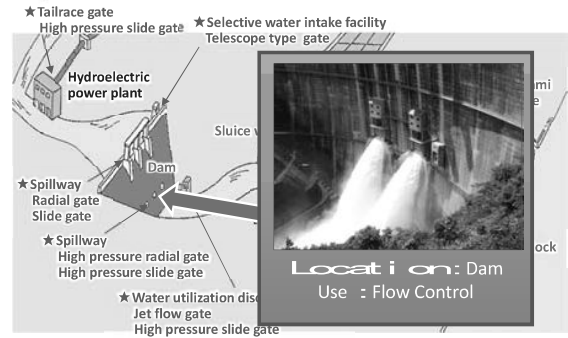
### Various Gates by Hitz



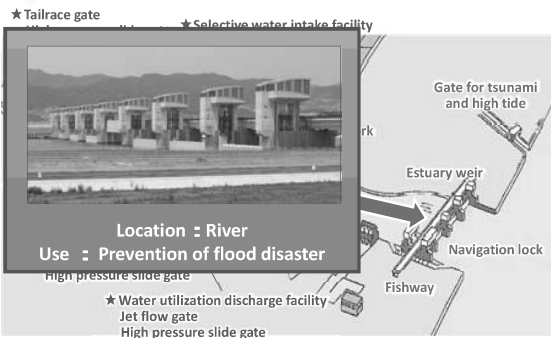
### Hydraulic Gate-----Dam~River



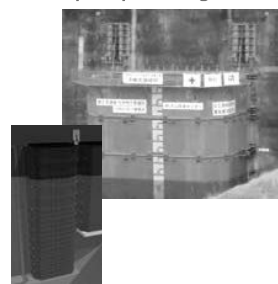
### Hydraulic Gate-----Dam~River



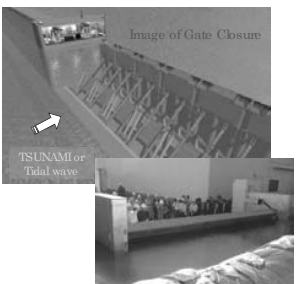
### Hydraulic Gate-----Dam~River



### Dam-Redevelopment--- Temporary Coffering bulkhead



### Tsunami-Protection--- Flap Gate



### Advantage of Hitz

1. So many experiences in gate works
2. Experiences of similar projects in Southeast Asia
3. Many achievements in various types of gates  
(Dam, River, Redevelopment, Flap)

### Thank You for Your Attention.



### Various gates by Hitz



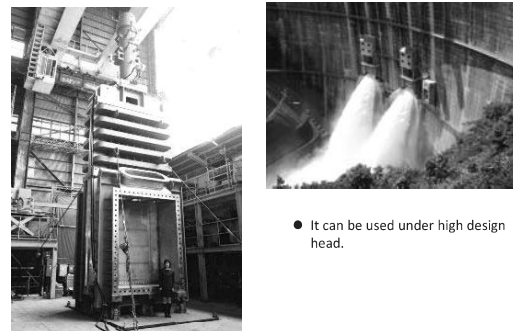
### Various gates by Hitz



### ☆For River---Weir Gate



### ☆For Dam---High Pressure Roller Gate



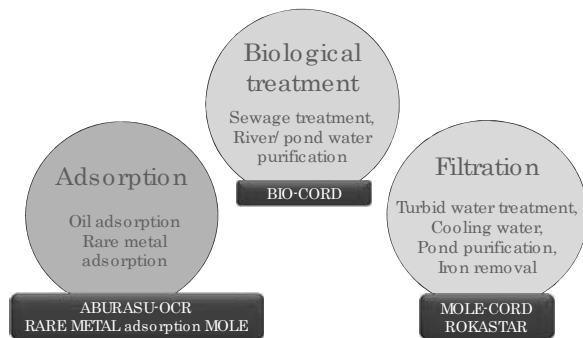
- It can be used under high design head.



# Water Purification Material of TBR



Dec, 2018  
**TBR Co., Ltd.**  
 TOSHIHISA KINOSHITA  
 Deputy Director,  
 Environment Division

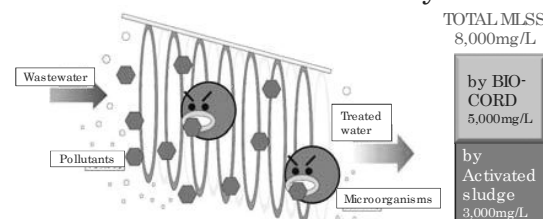


## What is BIO-CORD?



- Fixed bed developed by braiding technology, which can hold a large amount of microorganisms.
- Clean up water and air with the function of microorganisms.
- Able to improve the capacity of existing water treatment facilities.
- Does not require maintenance for a long time due to its structure being free from clogging.

## Features of Water Purification by BIO-CORD



- By increasing the MLSS concentration in the aeration tank, it is available to obtain cleaner treated water.
- By the generation of Metazoan organisms, the amount of excess sludge reduces by half.

## Bacteria Adhesion Status

Wastewater from Food Factory

Leachate from Landfill Site



SP-100

PP-45



Bread factory

Sesame oil factory

Milk factory

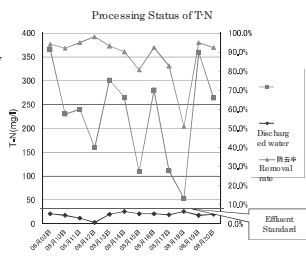
Metal plating factory

Leachate treatment facility in landfill site

Paper mill

## Case of Denitrification in Leachate Treatment in Landfill Site

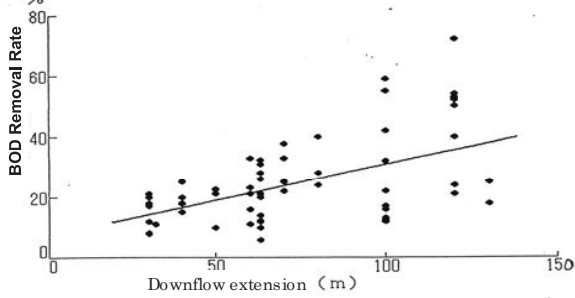
Volume of waste water :300m<sup>3</sup>/day  
 NH<sub>4</sub>-N concentration :300mg/L  
 Aeration tank :1,250m<sup>3</sup>  
 BIO-CORD :50,000m  
 NH<sub>4</sub>-N Volume load :0.07kg/m<sup>3</sup>·day



## River Water Purification in Indonesia JICA Feasibility Survey for an Application of High Efficiency Water Improvement System



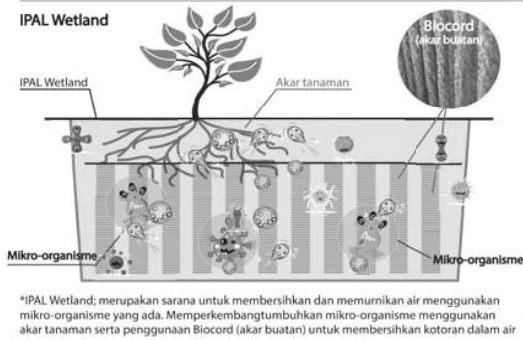
## Direct River Purification with BIO-CODE Downflow extension and BOD removal rate



## Analysis of the demonstration

		BOD	SS	NH <sub>4</sub> -N	T-P	Coli
Upstream	Max	31.0	64	0.40	0.50	16,400
	Minimum	23.0	10	0.05	0.10	13,400
	Average	26.2	31.1	0.2	0.3	15,217
Down stream	Max	23.2	28	0.30	0.30	14,400
	Minimum	12.7	6	0.01	0.02	8,800
	Average	18.2	15.6	0.1	0.1	11,325
Removal rate	Max	48%	91%	90%	80%	45%
	Minimum	18%	0%	25%	25%	9%
	Average	31%	42%	59%	50%	25%

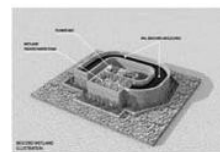
Demonstration verified a good performance of BIO-CORD for sewage in Indonesia



## PRODUCTS – IPAL WETLAND

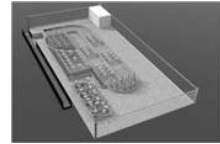


IPAL WETLAND 100KK



IPAL WETLAND 200KK

houses	Qsec	Q day	vol	area	flow
100 kk	0.23 l/s	20 m <sup>3</sup> /d	4.00 m <sup>3</sup>	5.8 m	18 m <sup>3</sup> /hour
200 kk	0.46 l/s	40 m <sup>3</sup> /d	9.20 m <sup>3</sup>	11.5 m	35 m <sup>3</sup> /hour
300 kk	0.69 l/s	60 m <sup>3</sup> /d	13.80 m <sup>3</sup>	13.8 m	53 m <sup>3</sup> /hour
500 kk	1.15 l/s	100 m <sup>3</sup> /d	23.00 m <sup>3</sup>	19.2 m	88 m <sup>3</sup> /hour
1000 kk	2.31 l/s	200 m <sup>3</sup> /d	46.00 m <sup>3</sup>	30.7 m	175 m <sup>3</sup> /hour



IPAL WETLAND 300KK

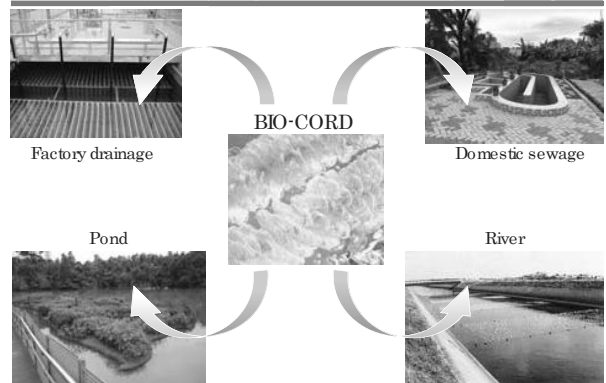
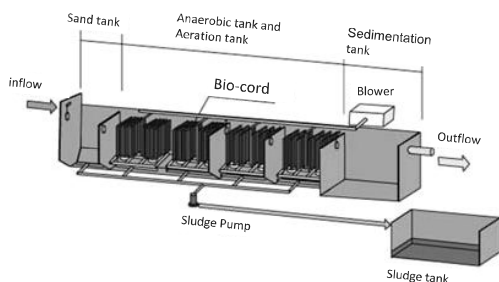
## IPAL WETLAND UTK DANAU TOBA Houses 200KK(40m<sup>3</sup>/day)



## IPAL WETLAND UTK KARAWANG Houses 300KK(60m<sup>3</sup>/day)



## JICA Project in Bekasi (500m<sup>3</sup>/day)



**Terima Kasih**

**TBR Co.,LTD.**