



HMBS  
DISPERCIVE BACTERIA  
TREATMENT SYSTEM  
USING MICROBUBBLES

TO CONTRIBUTE TO A SUSTAINABLE  
RECYCLING SOCIETY THROUGH WATER  
TREATMENT

HINODESANGYO CO.,LTD

19 JUN 2022

WIPO FOR OFFICIAL USE ONLY JCGI BUSINESS PITCH

# About Hinode Sangyo Co., Ltd

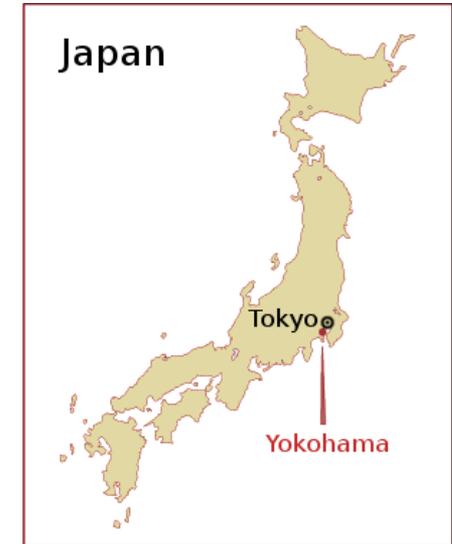


## Corporate policy

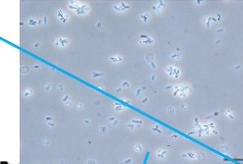
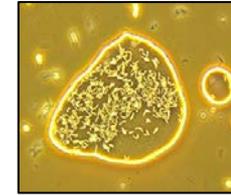
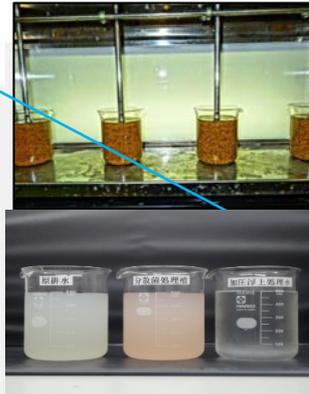
We consistently aim for new technologies and contribute to environmental conservation through water treatment.

## Our core value

To contribute to a sustainable recycling-oriented society  
through water treatment



# Our Business



## Drainage treatment solution development

Elbic series

## Drainage treatment facility, Demonstration and Maintenance

HMB micro bubble generator

HMBS i-HABS

## Environment-related quantification

水質分析 / 微生物分析

Sludge reduction, micro-organisms treatment, biological treatment

## Micro-organism solution for environmental cleanup

Development of new medicine and research of bacteria

## International technology transfer

Education of next generation

ABE initiative, Innovative Asia, etc

Education of next resources and international technology transfer





# HOW TO USING HMBS



## INNOVATIONS derived from “Hinode Microbubble Generator (HMB)”

### Advantages of HMB

- ◆ Generation of innumerable microbubbles

➡ Highly diffused oxygen (DO) enhances  
capacity of activated sludge treatment process

- ◆ Equalization of organic matter in wastewater

➡ Preventing flocculation of suspended matter.

Unprecedented method

called “ **Dispersible microbial Process**”



## Hinode Sangyo's technology package:

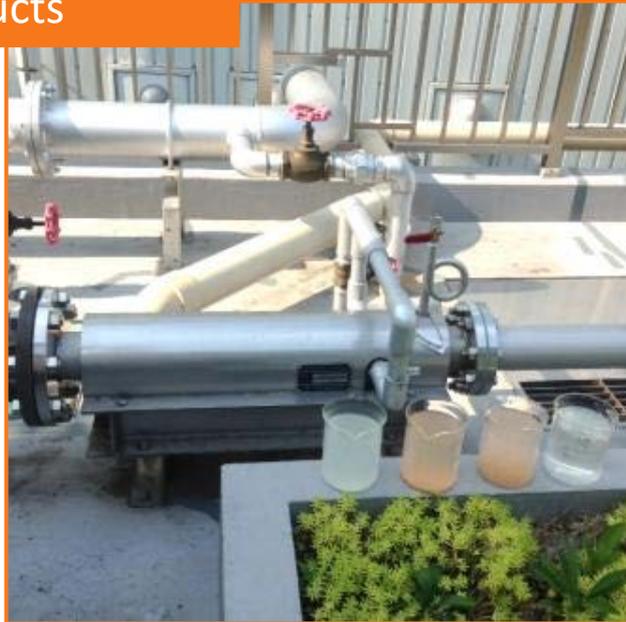
### Current Products



HMB: Hinode MicroBubbler



Microbial agents: Elbic BZ



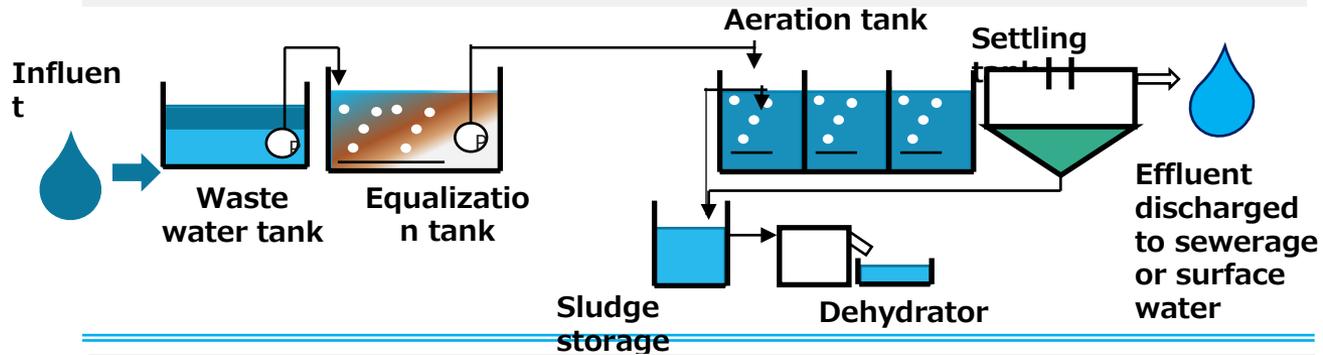
HMB installation and Treatment process

### Current Development

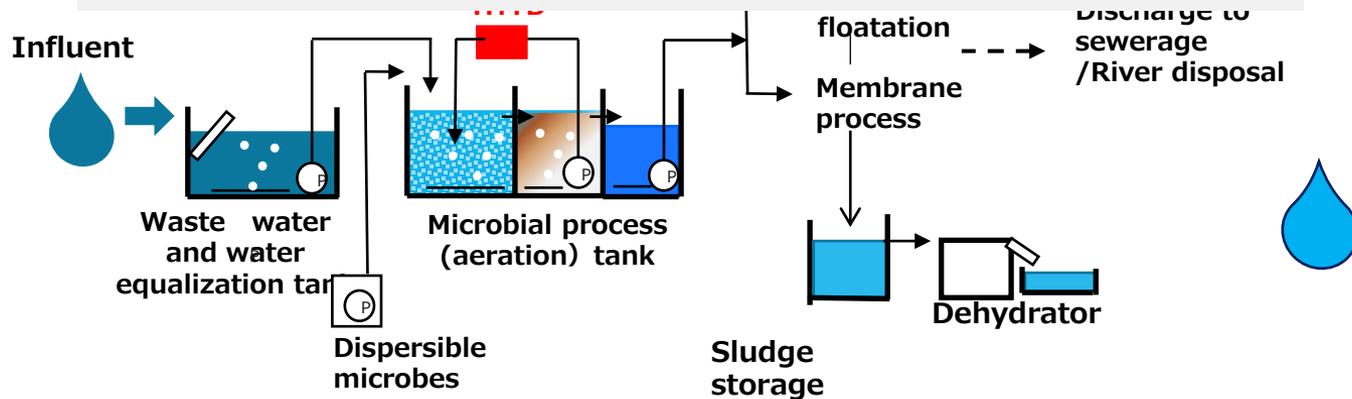
Selection, development of bacteria and agents that can be included in a Biological treatment method designed for treating marine pollution and effluents containing minerals

# Applications of the Innovative Technology

## Activated sludge process (conventional)



## Dispersible microbial process (Innovation treatment)



# Dispersible microbe system    Installation at new factory

**Treatment system:** Dispersible microbe system + Pressurized floatation process

**Facilities:** Food processing plant, mainly Bento boxed lunch (100,000 boxes/day)

**Water volume:** 300m<sup>3</sup>/day (discharge to sewerage)



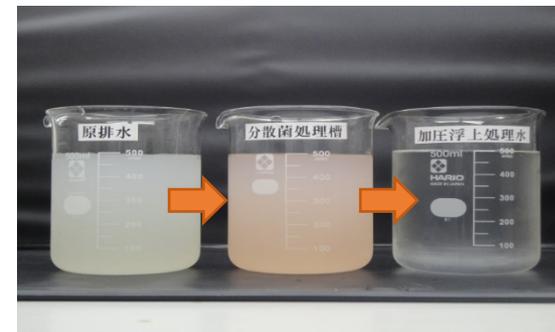
**WWTP, Food processing plant**



**Microbial process tank**



**Pressurized floatation equipment**



**Raw water→Microbial processed→Floatation**



# POTENTIAL OF TECHNOLOGIES FOR THE SGDS GREEN TECHNOLOGY



Challenge and Solution

Understanding Reciprocity of diverse technology and Innovation mechanism

Thinking Open Innovation and Future Missions

Sharing Challenges

# Environmental security and Water risks

## ▶ Stress region on a rapid surge

### ■ WATER RESOURCES (GLOBAL)

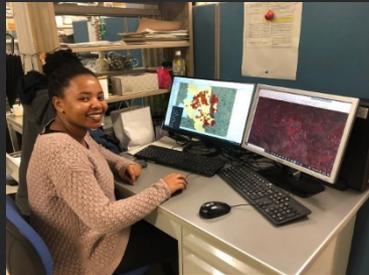
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- A) Population increase
- B) Global warming
- C) Increase in use of water by emerging and developing countries

### ■ CHALLENGES

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- A) Drinking water in developing countries and lack of agricultural water
- B) Change in rainfall (torrential rains and desertification)
- C) Water contamination (eutrophication and chemical contamination)



# Solution

Connect with the world through technology



## Priority of social challenges

## Development of technology transfer

## Commercialisation

Who needs it? What is needed?

Open innovation and reverse innovation

For oneself and those who are around to be independent?

How do you create opportunities?

High spec or needs-oriented?

Why do you use this technology?

How do you pass onto the next generation?

Using licence and knowhow to expand

Involve others and seek help where one cannot resolve oneself!

# Challenge ① Agricultural wastewater and sludge treatment



**Toward the SDGs**

Eco-friendly and resource-recycling technologies

↓

HMB+Neo System Resource circulation system

HMB導入例



## Problems faced by wastewater treatment

### • 余剰汚泥の処理問題

1. 焼却処理
2. 埋め立て処理
3. 河川、湖沼、海の汚染



## Agricultural drainage



農村集落排水事業とは  
農村地域（農業振興地域）でし尿や生活排水を集め処理する施設。

## Solving wastewater treatment problems

### solution

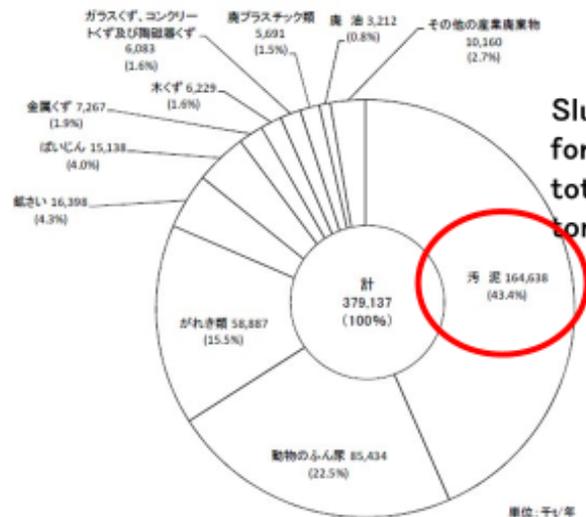
① Enhancement of dissolved oxygen ⇒ HMB

② Adjustment tank ⇒ Conversion to biological tank

③ Neo System ⇒ Stabilization of BZ bacteria count



## Discharge of industrial wastes



Sludge accounts for 43.4% of total 1.6 million tons/year

単位: 千t/年

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## Dehydration of sludge ⇒ Drying

- 泥水状態の余剰汚泥を脱水し、水分を少なくしたケーキ状の汚泥にする。



## Distribution to farmers as fertilizer



# 2016-2021 internship trainees Country of origin



- アフリカ以外の国
-  Solomon Islands
  -  Bangladesh
  -  Thailand
  -  Vietnam
  -  CAMBODIA
  -  Malaysia



## PHILIPPINES & MOROCCO

Where can we use the patented technology?



# To contribute to a sustainable recycling society through water treatment

Lesson learned from JICA project in the Philippines

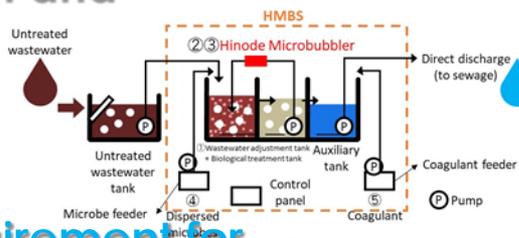


## Purpose

◆To address lack of hygiene system and improve dysfunctions in the city of Cagayan de Oro in Mindanao

## Result

- Greatly reduced BOD, COD, SS
- Still a challenge in meeting the requirement for NH4 and Phosphorous (New standard for the drainage system)



## Way forward

◆Use existing water treatment facility; and introduce a system that can be maintained by the local users and that meet the new standard

→ **A2O + HMBS System** (HABS)



## Stakeholders



# To contribute to a sustainable recycling society through water treatment

## III Using Japanese technology for the measures against the corona virus 【UNIDO】

### Ongoing projects

#### Domestic Wastewater treatment System in Morocco

##### Purpose

To improve health, sanitary and hygiene environment to fight against COVID-19 and other infectious diseases through technology demonstration and transfer from Japan

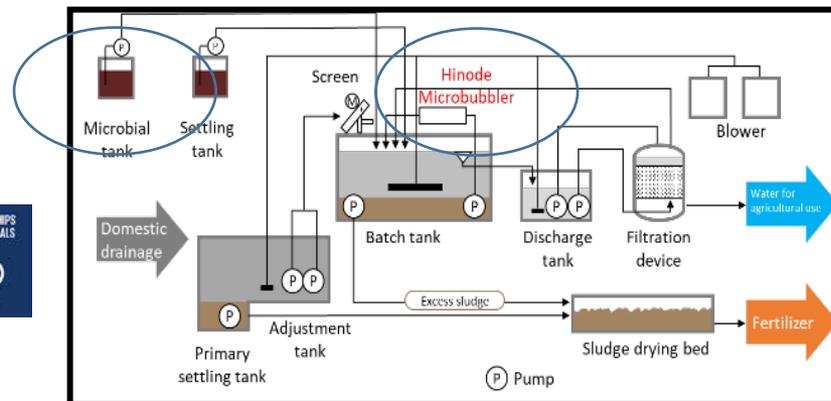
Location *Tazart commune, ALHAOUZ*

##### Stakeholders



Local community

NGO





# Does water treatment relate to only 6 SDGs?

Purpose of Water Treatment





# WHAT NEXT?

## Partnership and Business Expansion

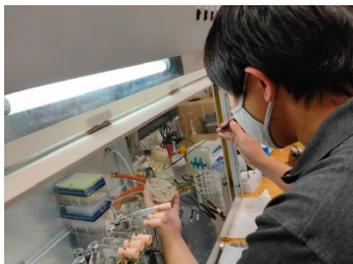


To check

Who will be  
the partner  
as Front liner

Share values, Work  
Together and Co-create

- Technical Innovation, Securing and Training Human Capital
- Reciprocity in business opportunities
- License-out and royalty
- Is our business feasible in that particular market
- →Need for technology and IP strategy to go beyond domestic market



17 パートナーシップで  
目標を達成しよう



HINODESANGYOCO.,LTD.

Thank you so  
much



+81 45 507 3031

Kaori FUJITA  
k-fujita@hinosangyo.com



<https://www.hinosangyo>



[.com/](#)