

# Yachiyo Engineering Co., Ltd.

Business Domain : Consulting Firm for Planning & Design  
Establishment : 29 January 1963  
Capital : USD 4.1 million (JPY 110 = USD)  
Annual Sales : USD 196 million (2021)  
No. of Staff : 1,194 (as of Jul. 2021)  
Overseas Offices : Vietnam, Indonesia, Myanmar, India, Korea, Brazil, and Nigeria  
Contact : intl@yachiyo-eng.co.jp  
Website : <https://www.yachiyo-eng.co.jp/e/>

**Innovative Solutions  
for the Society**



<b>Experience in the Environmental Field in Southeast Asia</b>	<b>Client</b>
The Project for the Construction of Waste-To-Energy Facilities in Davao City in the <b>Philippines</b>	Crown Agents Japan
Preparatory Survey for Septic Tank Sludge Treatment Construction Project for Metro Cebu in the <b>Philippines</b>	JICA
Verification Survey with the Private Sector for Disseminating Japanese Technologies for Environmentally Friendly Urban Transportation Systems Using Electric Tricycles in the <b>Philippines</b>	JICA
Data Collection Survey for Marine Debris Monitoring and Waste-to-Energy for Formulation of Circular Economy in Thailand	JICA
Project for Capacity Development of Central and Local Government for 3R and Domestic Solid Waste Management System in Indonesia	JICA
Study on the Project for the Promotion of the Circular Economy and 3R in Vietnam and Indonesia	IGES, Japan
Study on the Environment-Friendly Smart Community in Phnom Penh, Cambodia	METI, Japan
Study on the Bilateral Cooperation on 3R and Proper Waste Treatment in Vietnam	MOE, Japan

# Environmental-friendly Urban Transport in the Philippines

## Concerned Development Issues in the Philippines

- Improvement of air pollution mainly from carbon emissions in Metro Manila
- Establishment of alternative means of transport → conversion from existing tricycles which are commonly used by local people

## Implemented Activities in the Survey

- Introduction of 20 units of Electric Tricycles in Quezon City to develop operation and management structure composed of local organizations
- Examination of feasibility of conversion from existing tricycles to Electric Tricycles through the analysis of collected data (operation record, profit, cost, etc.)
- Establishment of sustainable Electric Tricycle business model

## Proposed Product/Technology



**Electric Tricycle: 68VM**  
 -Electric three-wheeled motor vehicles of maximum speed 50km/h, 7 pax capacity (incl. driver).  
 -Comfortable ride comparable to four-wheeled vehicles, safe driving, electric bill reduction, longer life of the battery.

### Survey Overview

Quezon City, Metro Manila  
 March 2016 - August 2017

## Impact on the Concerned Development Issues in the Philippines

- Improvement of administrative capacities of local government on the diffusion policies of Electric Tricycles
- Promotion of understanding of local people and private operators on the conversion to Electric Tricycles
- Promotion of the projects on the introduction of Electric Tricycles being executed by the Government of the Philippines

## Outputs and Outcomes of the Survey

### Present

- Mass production system of Electric Tricycles has been developed through the establishment of local subsidiary and factory.
- Electric Tricycles have been introduced to private operators in Boracay and the University of the Philippines.

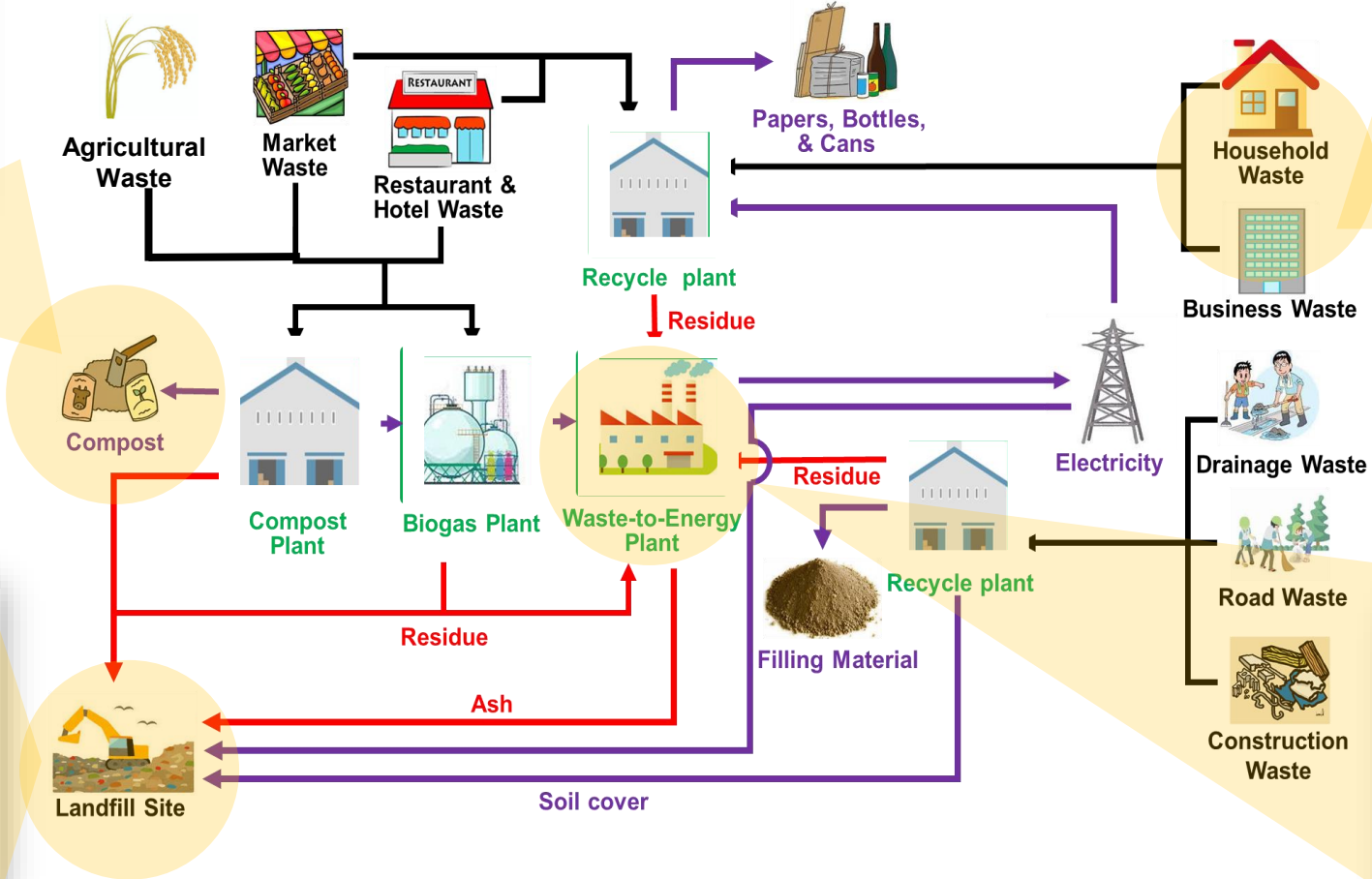
### Future

- Sales will be promoted through local subsidiary and partner companies
- Business will be expanded to other Asian countries

# Aiming Toward a “Sound Material-Cycle Society”

*“A society in which the consumption of natural resources will be conserved and the environmental load will be reduced to the greatest extent possible, by preventing or reducing the generation of wastes, etc. and by promoting proper cyclical use and disposal of products, etc.”* -Basic Act on Establishing a Sound Material-Cycle Society, Japan (promulgated in June 2000, put in force in January 2001) Article 2]

## Ideal Image of a Sound Material-Cycle Society



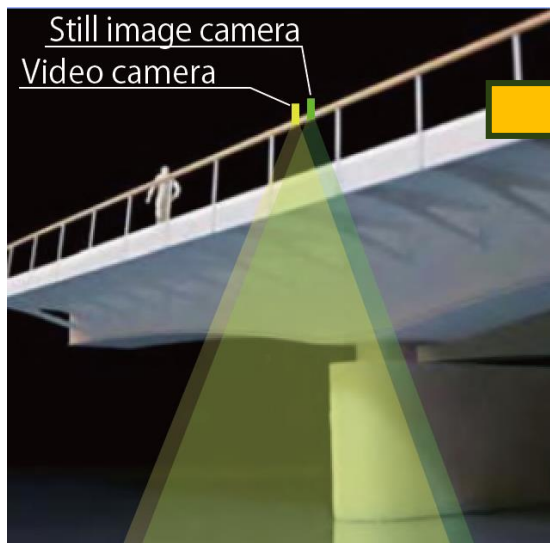
# RIAD : *R*iver *I*mage *A*nalysis for *D*ebris transport

- Plastic pollution is recognized as an important global environmental issue. **SDGs** include preventing and significantly reducing marine pollution (with the index of floating plastic debris density as indicator).
- It is also described in Philippine Clean Water Act of 2004 (Republic Act No. 9275)
  - Section 27 prohibits unauthorized transport or dumping into sea waters of sewage sludge or solid waste
- 70~80% of marine debris originate from land-based activities and **flow into the ocean via the river.**

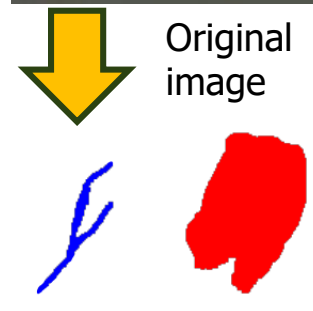
## RIAD is a solution!!

**River Image Analysis for Debris transport (RIAD) is a system of:**

1. Recording of video & photo images of river water surface.
2. Automatically analyzing the video/photo to identify man-made and natural debris, and then estimate the actual amount of man-made debris flowing in the river



Original image

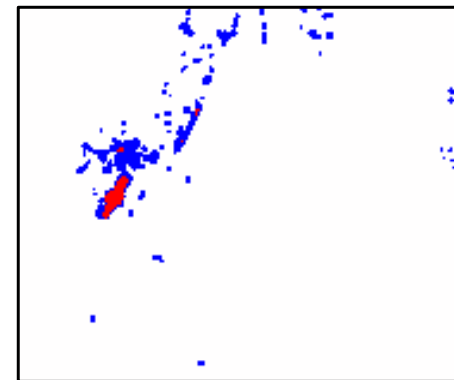


Auto-selection of man-made debris

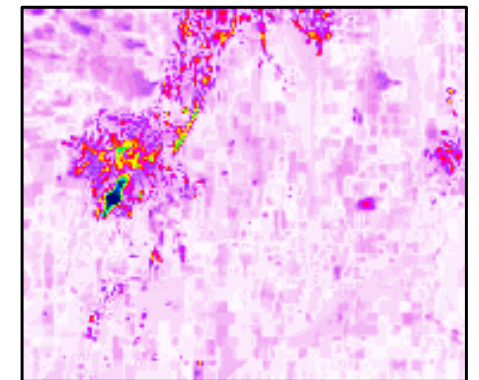
Original



Debris



Difference



Result of image analysis

Blue: Natural debris / Red: Anthropogenic debris