

# Research Cooperation Abroad

## Topics for 2022 (i-environment)

- Building a local sustainable supply chain network for recyclable materials for medium-sized cities in SE Asia (Indonesia): kerjasama dengan HWU- **membangun aplikasi IT system untuk meningkatkan recycling waste.**

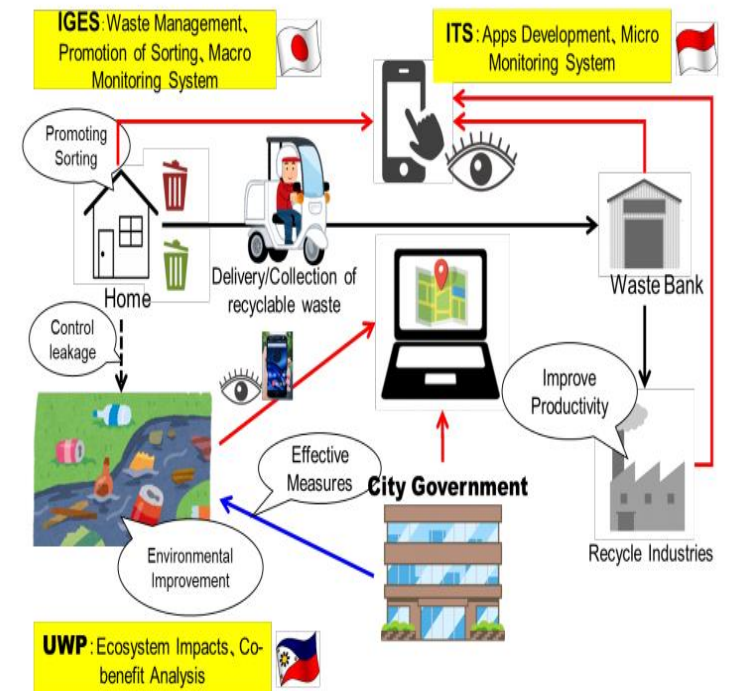


Figure 1 Overall framework of activities

# Research Cooperation Abroad

## (i-environment)

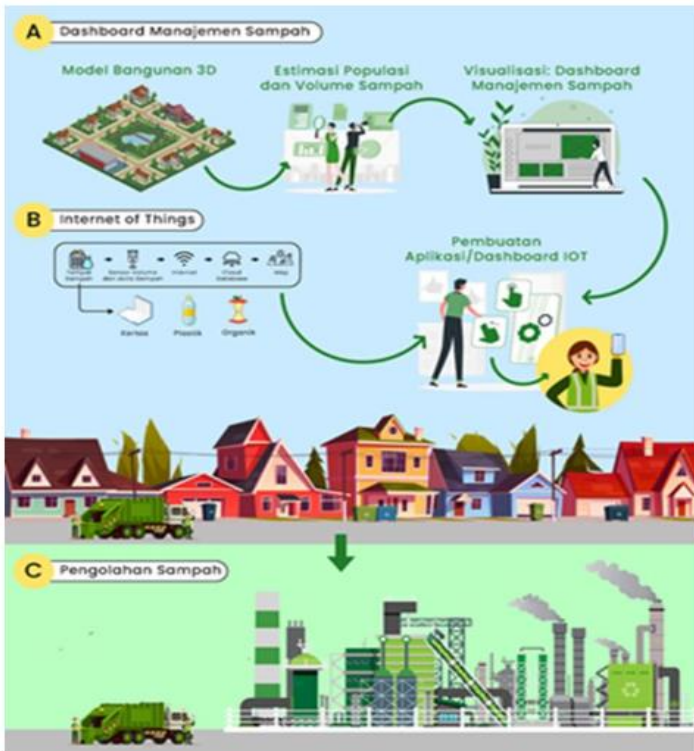


Figure 1. Research stage

Partnership Research: **3D maps and automation of waste separation and waste collection at ITS**, Cross departments: Geomatics, Environmental Engineering, Informatics Engineering, Instrumentation Physics Engineering. Cooperation with IGES Japan.

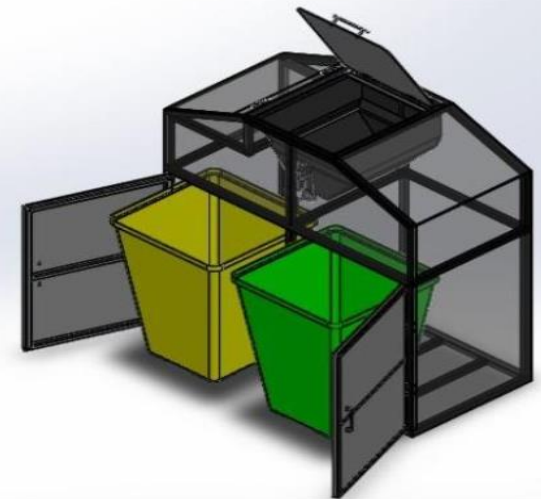


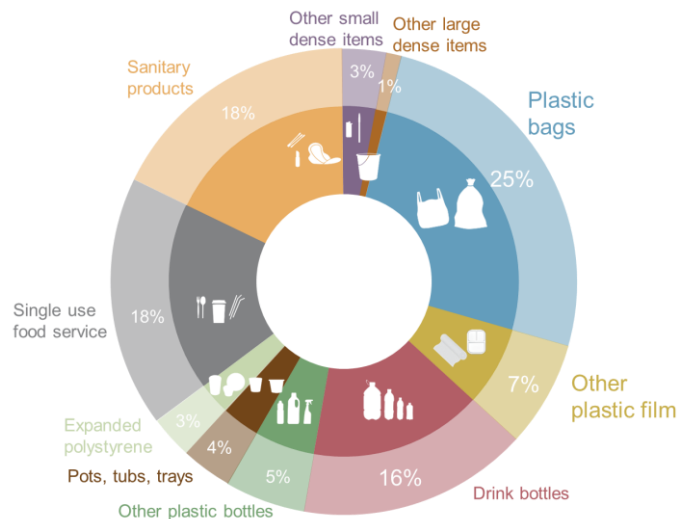
Figure 7. Design Prototype of Trash Bin

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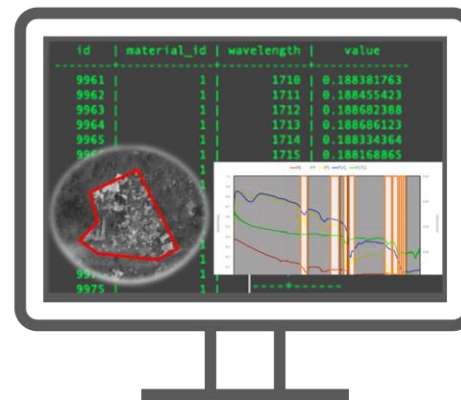
Cooperation With : UNESCAP+IGES Jepang+ Leed Univ.+ KLHK

Total Budget : IDR 288.000.000+ IDR. 551.362.250

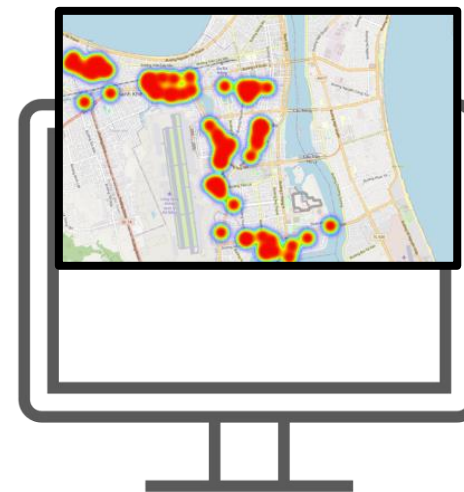
• Closing The Loop " **Action Plan Plastic Waste in six ASEAN Country** ". Monitoring Leakage of Plastic Waste



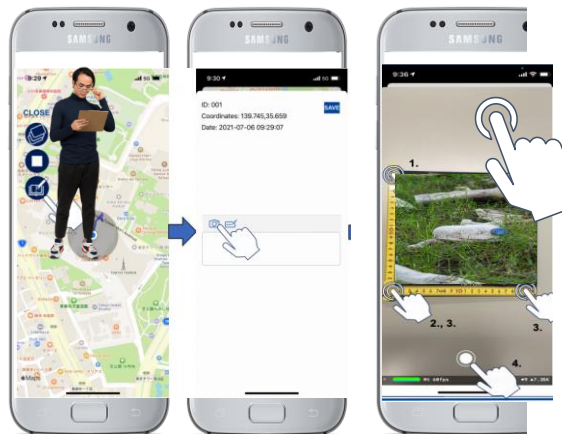
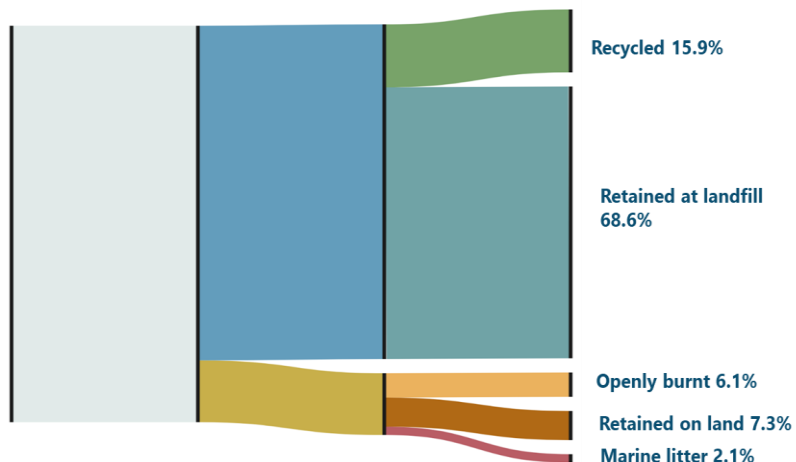
WE COLLECT DATA



WE TURN IT INTO INFO ABOUT POLLUTION



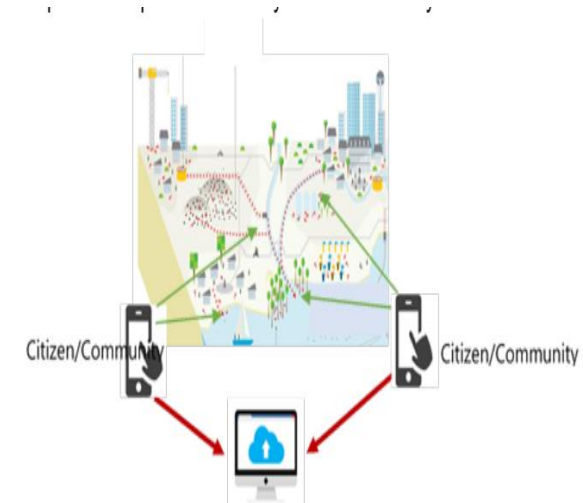
CREATE INSIGHTS WITH HOTSPOT MAPS



CITIZEN SCIENCE



LOCATION MAPPING



Data Process, Interpretation & Analysis by AI at local University

# Research Cooperation Abroad



Gambar 3. 2 Jamban Sehat dengan Sistem Cetak

Engaging Business Development to Build Business Capacity of Sanitation Entrepreneurs in East Java Region



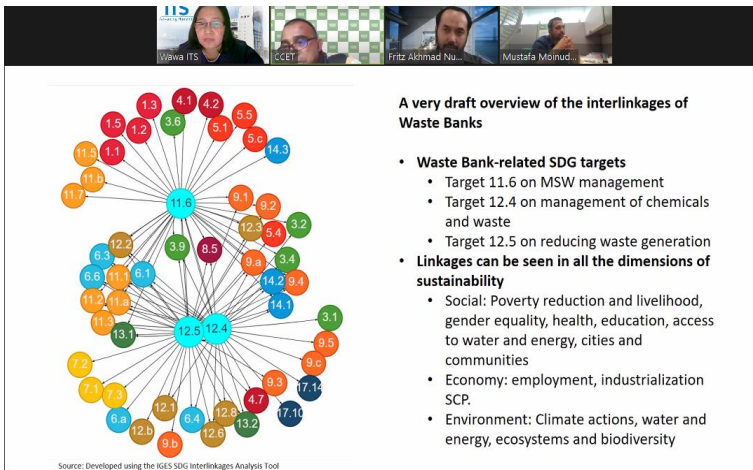
**USAID**  
DARI RAKYAT AMERIKA

**ITS**  
TEKNO  
SAINS



# Research Cooperation Abroad

Systematic analysis and identify factors for successful application of waste banks

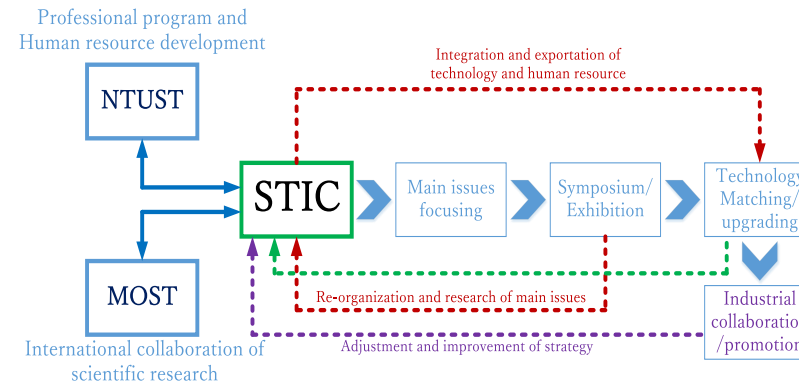


## Joint Publications



Waste Bank Training Module for Developing Countries: Sri Lanka; Bangladesh; Philippines

Indonesia-Taiwan Innovation Center for Circular Economy and Green Innovative Resources (NTUST-ITS-UWM-LIPI) 3 tahun



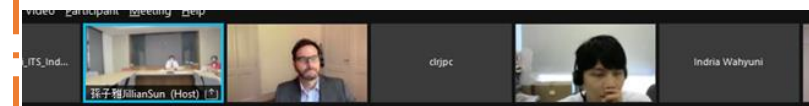
Focusing on **reuse of industrial/agricultural byproducts and waste as construction materials, fertilizer, etc.**

Coal fly ash, water (alum) sludge, furnace slag, and spent bleaching clay are chosen.

## Microplastic and Aeration at PDAM

Worldwide Universities Network (WUN) & Global Research Group – Asia SDGs (NCKU-ITS-Auckland Univ.)

“Drinking Water Quality: Sharing the technologies and identifying the issues”



## Funding Details

### Amount

- \$400,000 NTD in total per project
  - First 200K - 2021
  - Second 200K - 2022

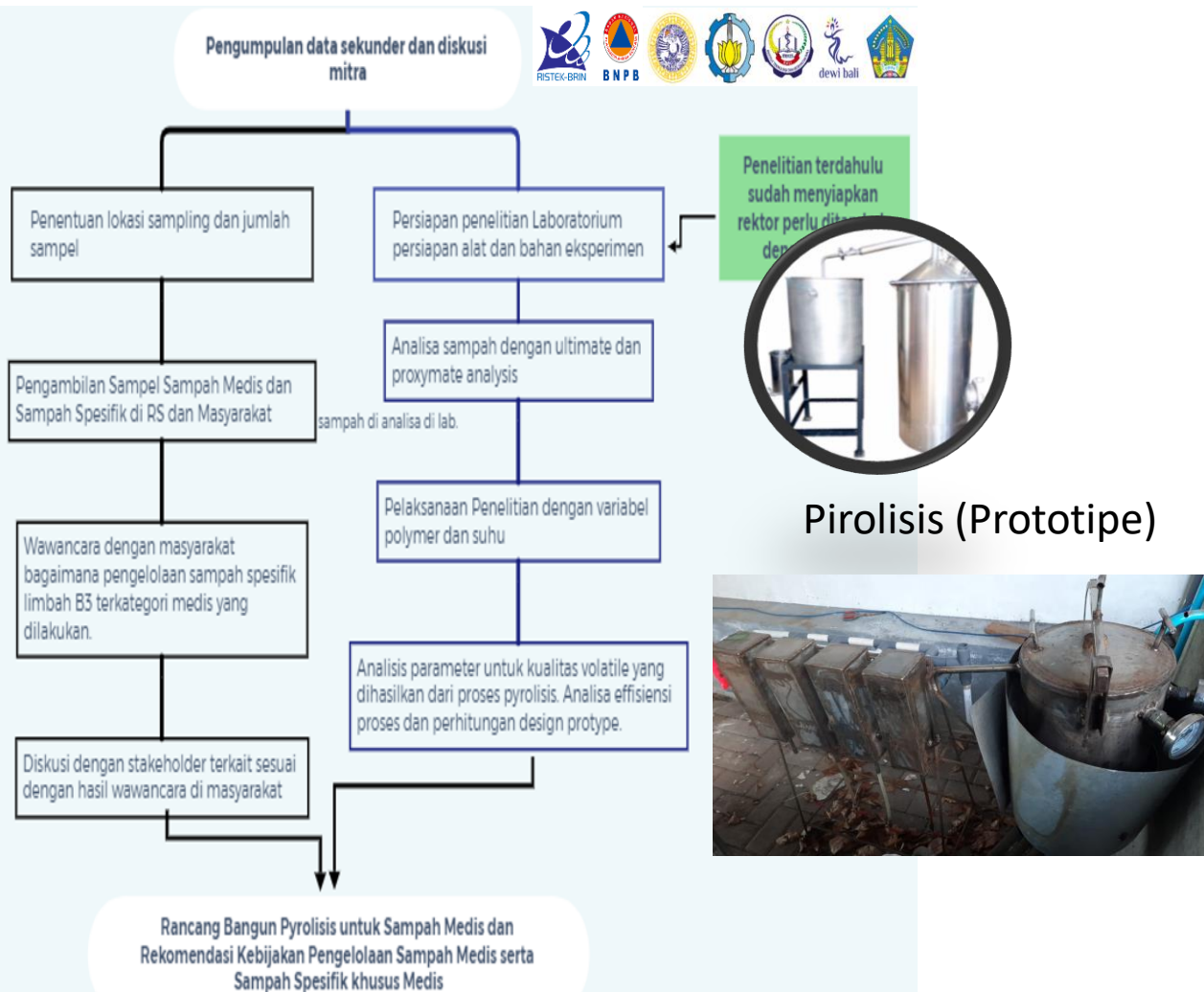
### Restriction

As the Asia SDGs Group is fully funded by NCKU, in light of some internal/domestic restrictions, the fund needs to go through a local account.



# Research Product

## Gate Green: (FROM GARBAGE TO ADVANTAGE) ALAT PENGOLAH SAMPAH MEDIS COVID-19



### PROPOSAL

## SOLUSI TERINTEGRASI SAMPAH MAKANAN

dengan Biokonversi  
Black Soldier Fly

#### Tim Pengusul:

**Ketua Pengusul:**  
Ary Bachtiar Krishna Putra, ST, MT, Ph.D  
/ Teknik Mesin / FTIRS / ITS

**Anggota Pengusul:**  
Ir. Arief Abdurrahman, S.T., M.T.  
/ Teknik Instrumentasi / FV / ITS

IDAA Warmadewanthi, ST., MT., Ph.D.  
/ Teknik Lingkungan / FTSPK / ITS

Arseto Yekti Bagastyo, ST., MT., NPHIL, Ph.D.  
/ Teknik Lingkungan / FTSPK / ITS

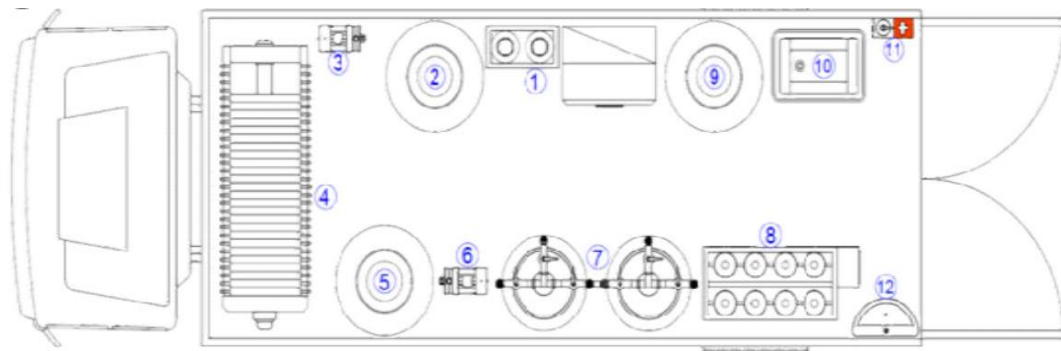
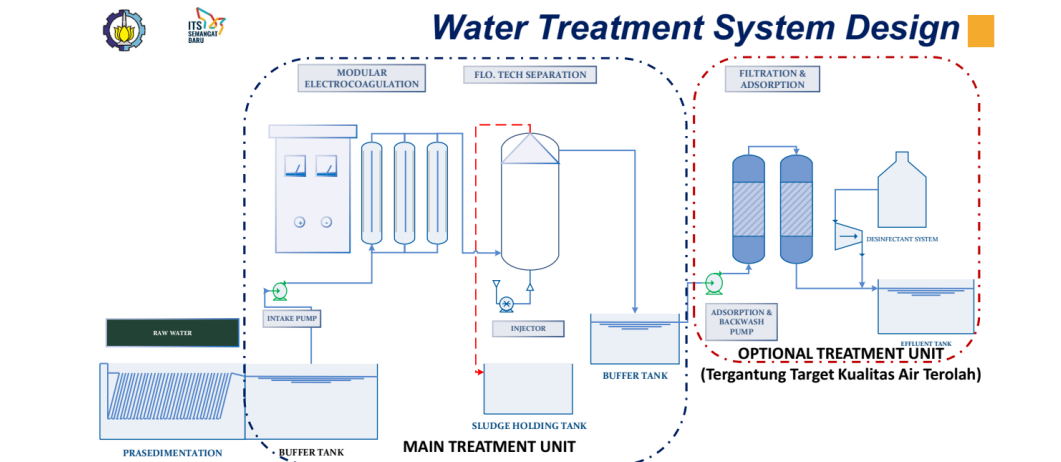
Dr. Eng. Hosta Ardhyana, ST, MSc (L)  
/ Teknik Material dan Metalurgi / FTIRS / ITS

Dr. Dian Saptarini  
/ Biologi / FSAD / ITS

Pubi Sinansari S.T., M.M.  
/ Manajemen Bisnis / FDKBD / ITS

DIREKTORAT RISET DAN PENGABDIAN KEPADA MASYARAKAT  
INSTITUT TEKNOLOGI SEPULUH NOPEMBER  
SURABAYA  
2021

# Research Product



**LEGEND :**

No.	DESCRIPTION	SPECIFICATIONS	No.	DESCRIPTION	SPECIFICATIONS
1	REACTOR EC AND RCJ FULL SET	KAP. 5M3/ HOUR	7	ADSORPTION TANK DOUBLE STAGE	FRP. 2472
2	BUFFER TANK	KAP. 350 LT	8	ULTRAFILTRATION	KAP. 5M3/ HOUR
3	FILTER PRESS PUMP	KAP. 5M3/ HOUR	9	BUFFER TANK	KAP. 350 LT
4	FILTER PRESS	1765x600x615MM	10	GENSET	MAX. 15 Kw
5	BUFFER TANK	KAP. 350 LT	11	APAR AND P3K KIT	-
6	ADSORPTION PUMP	KAP. 5M3/ HOUR	12	WASHING	-

*Mobile water treatment (For post disaster water fulfilment) :*  
 inventor: **Arseto Yekti Bagastyo, ST, MT, Mphil., PhD**

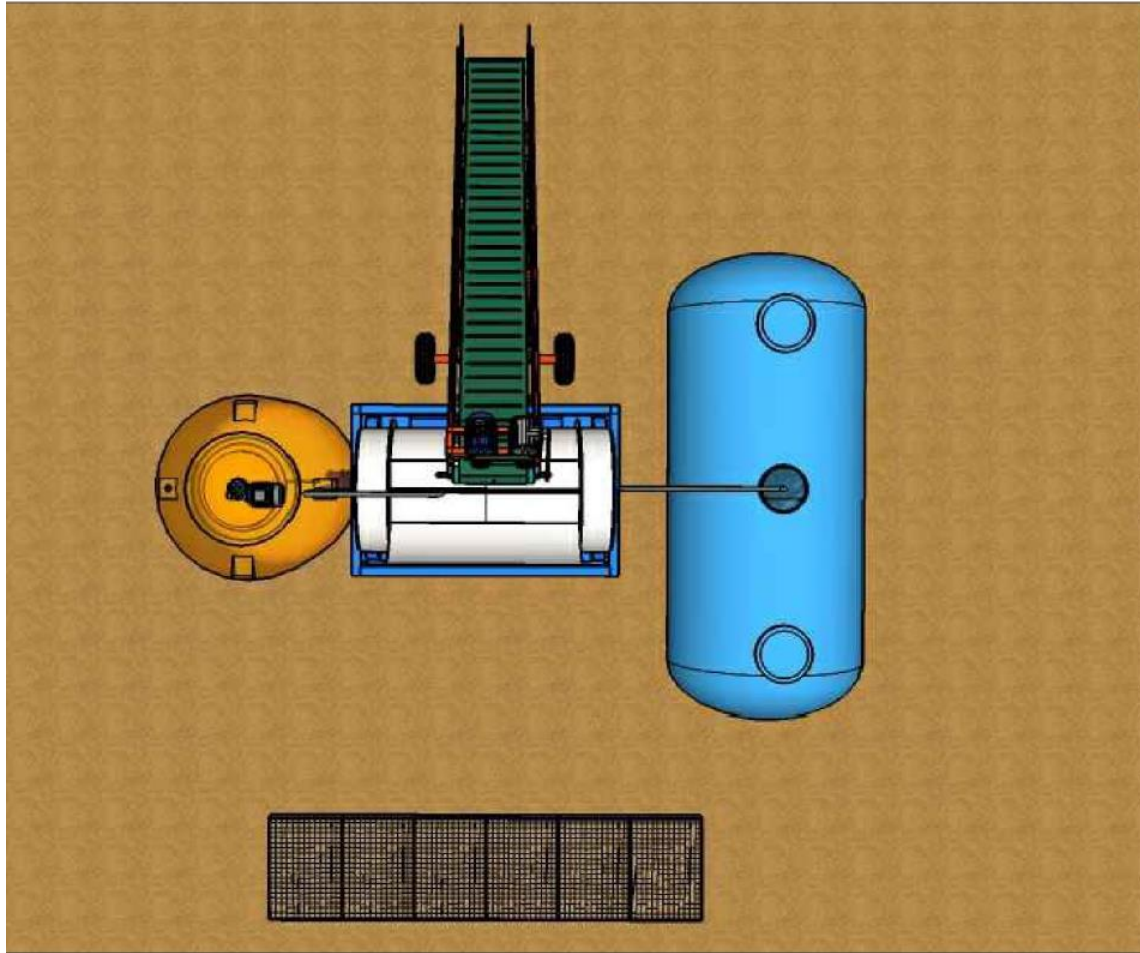
## TI-Rang, Pelet Olahan Limbah Cangkang Kerang & Perut Ikan Buatan ITS

TOPICS: TI-Rang Pelet Ikan Tim Abmas ITS

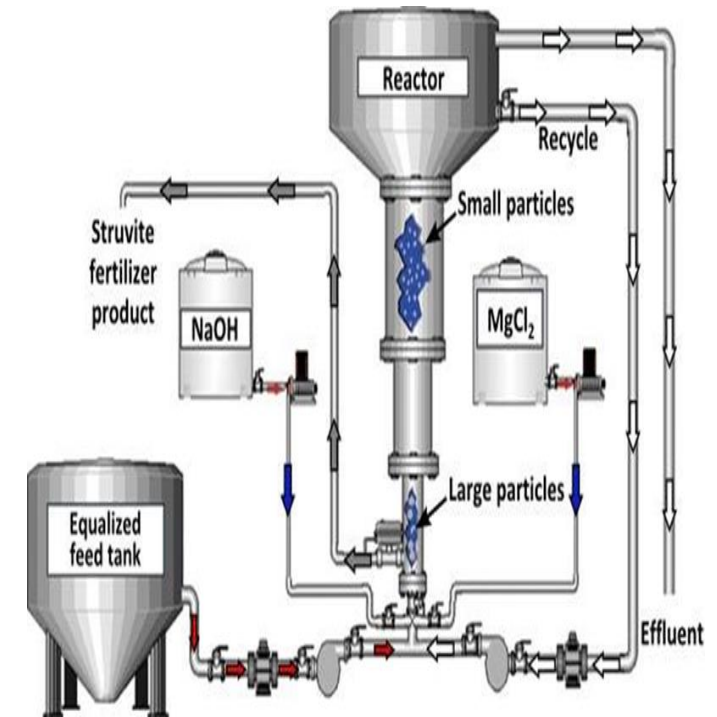


*Ti-Rang (recovery of fish stomach waste and selfish shell waste as fish feed):*  
 inventor: **Dr. Awik Puji Dyah Nurhayati, S.Si., M.Si.**

# Research Product



*Soil Washing untuk Bioremediasi* : inventor: **Ary Bahtiar Krisna Putra dan Bieby Vojant Tangahu**

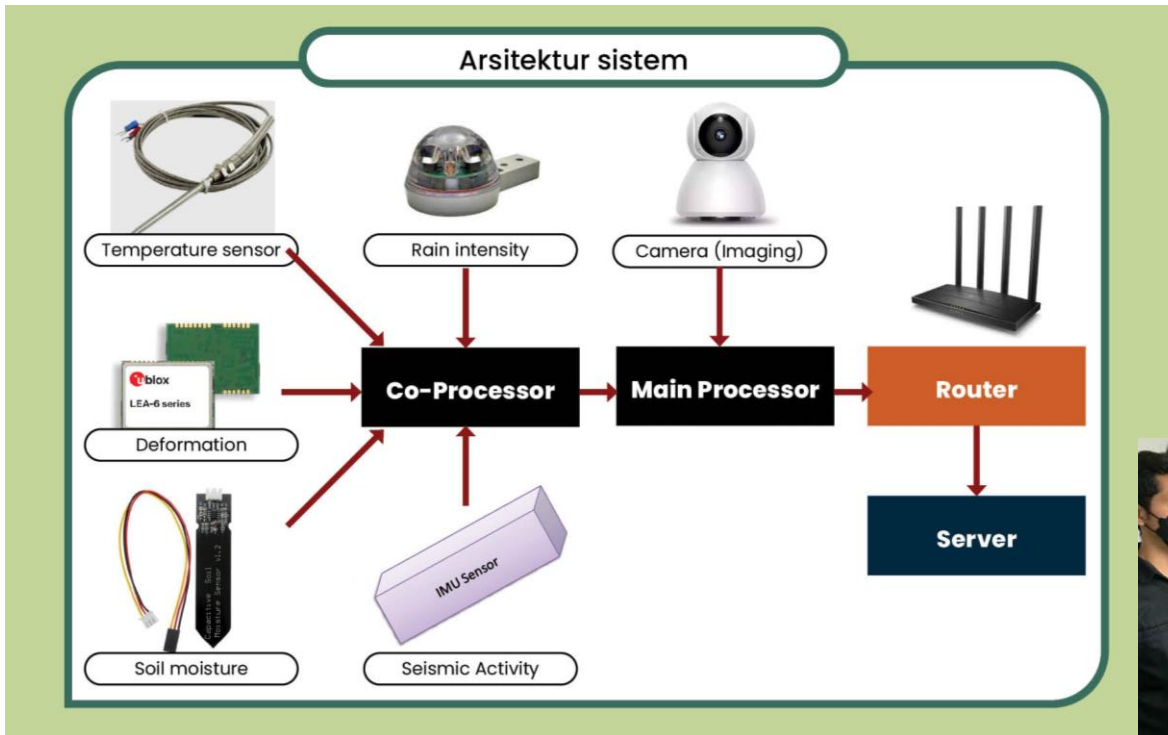


Recovery of Salt Production Waste into higher selling value product.



# Research Product

## Early Warning System Semeru



# Research Product



## Water Piping Leak Detector using Non-Intrusive Ultrasonic

Water leakage is a common problem when transporting water. Based on a 2018 study in Australia, an estimated 12% of water is lost due to leaks. In some developing countries, the rate of water loss can be even higher. To find out the exact location of the leak, it is necessary to monitor the behavior of the system. Measurement of water flow and water pressure is an option to monitor information about the Water Distribution Network to detect leaks and their position. Ultrasonic Water Flowmeter TUF-2000 is a tool for measuring water flow in pipes. This tool can obtain flow data that contains data on the flow of water in a pipe. We use the Local Outlier Factor (LOF) Algorithm to detect flow anomalies. The location of the anomaly can also be estimated based on the sensor location. These method can accurately detect sudden changes in flow that are suspected to be a sign of a leak. However, the challenge is that the flow of evolution changes due to small leaks, because these types of leaks can result in evolving outlier detection models.

### Arsitektur sistem yang diusulkan

