

City Cluster in Waste Management –
Gamping Fruit Market in Sleman Regency, Indonesia –
the Project and the Future –
Appropriate Transfer and Management through Partnership

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INDONESIA

- **Population:** 222 million
- **Capital:** Jakarta, 13 million
- **Nature:** a vast equatorial archipelago of about 17,000 islands extending 5,150 kilometers (3,200 miles) east to west
- **Language:** Bahasa Indonesia, English, Dutch, Javanese, and other local languages

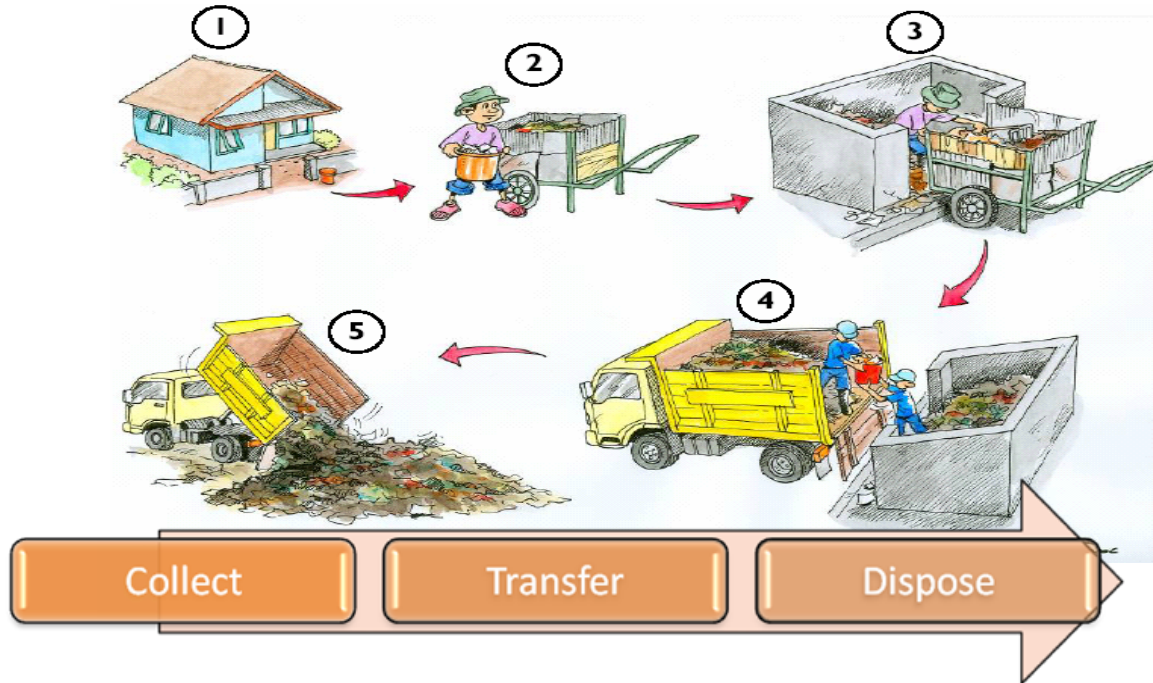




GADJAH MADA UNIVERSITY

- Location: Yogyakarta
- 18 Faculties
- 2 schools:
 - graduate (multidiscipline) school
 - vocation school
- More than 200 study programs
- 25 research centers
- About 55,000 students
- Further info: www.ugm.ac.id

Current practice of (municipal) solid waste management in Indonesia



Consequences

- require wide land
- Problems of pollutions
- Social conflict
- Wasting resources - unsustain

Several initiatives in 3R Programs



- Community based waste management
 - Sorting at the source (household)
 - Waste bank
 - Waste processing (compost, fuel from waste plastics)
- Private based waste management
 - Organic fertilizer
 - Energy

Demo Plant – Biogas from fruit Waste

Location: “Gemah Ripah” Fruit Market, Yogyakarta



Waste	Mass (kg/day)	%	Type of Fruit	%
Fruit Waste	8,013	80.13		
Rice Straw	652	6.52	Orange	64.67
Leaves	325	3.25	Mango	24.72
Wood	10	0.10	Apple	5.03
Fabrics	735	7.35	Pineapple	1.99
Plastics	265	2.65	Watermelon	1.22
Total	10,000	100	Others	2.37



Demo Plant – Biogas from fruit Waste

- 4 tons / day of rotten fruits
- Waste → Biogas → Electricity
- Potency of gas: 333 Nm³ with 54% CH₄
- Potency of electricity: 548 kWh /day
- Launched February 11, 2011

Before and After the Demo Plant



Partnership

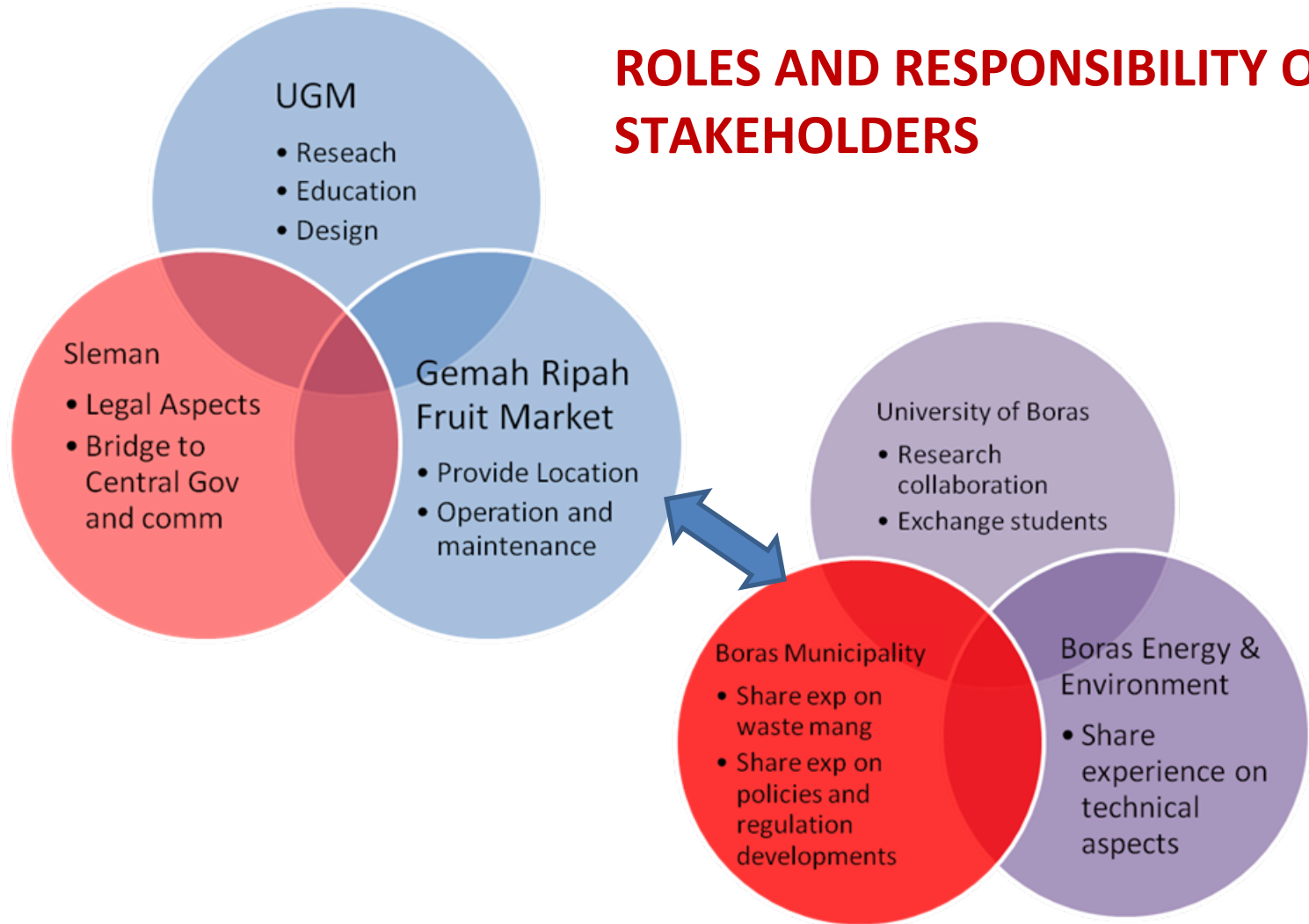
- **National**

- **University: UGM**
- **Local Government: Sleman**
- **Private: Koperasi Gemah Ripah (Fruit Market Cooperation)**

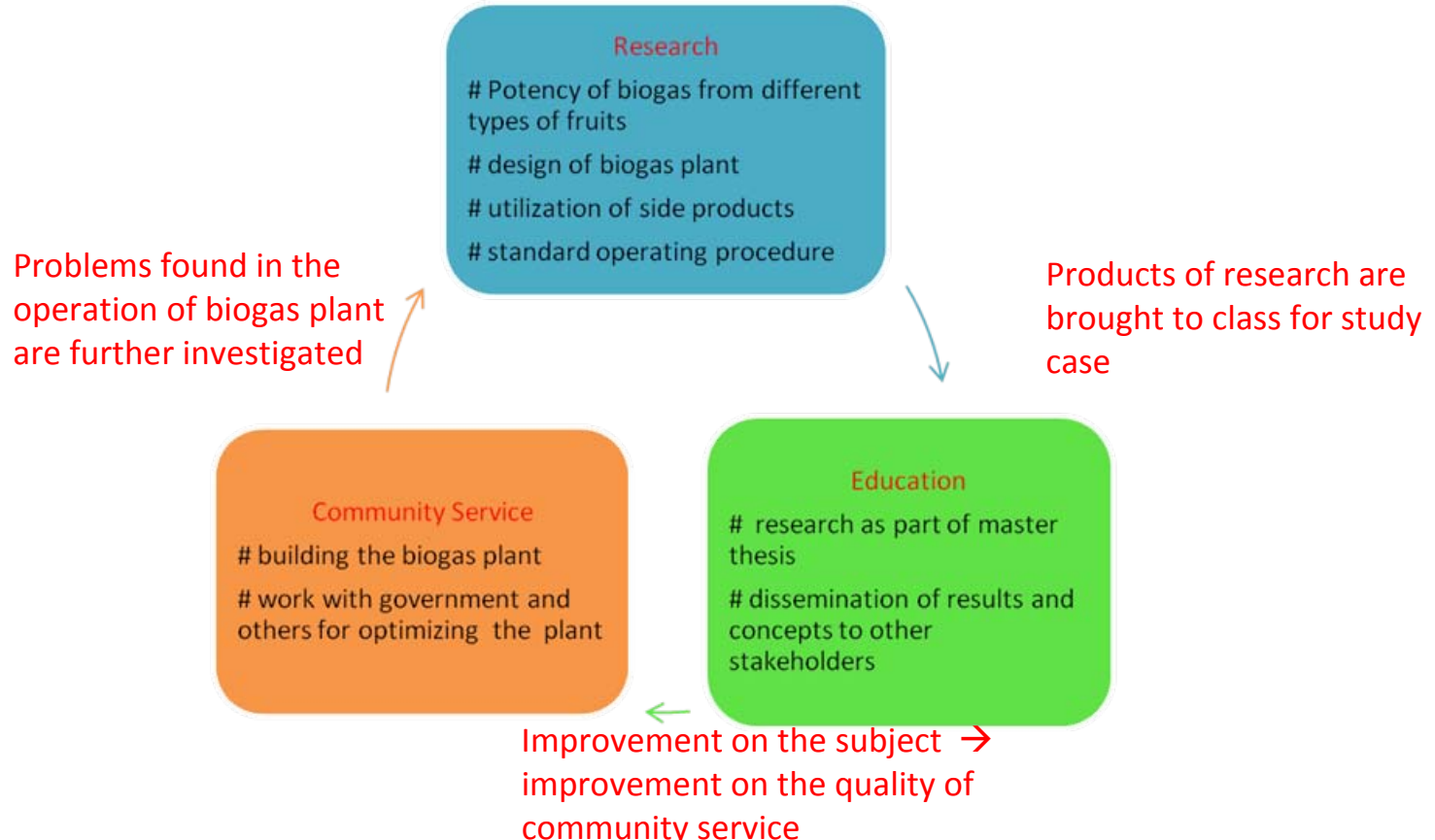
- **International**

- **University: University of Boras, Sweden**
- **Local Government: Boras Municipality**
- **Private: Boras Energy & Environment**

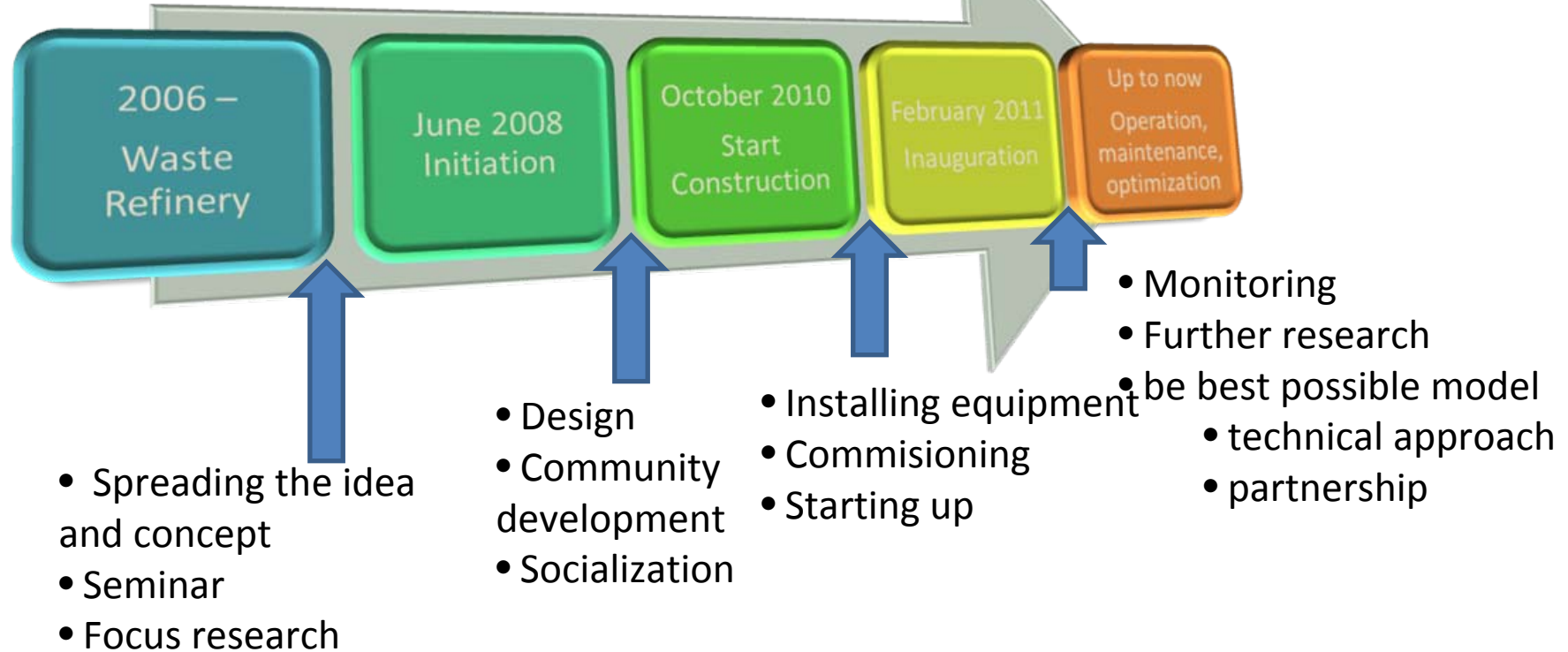
ROLES AND RESPONSIBILITY OF STAKEHOLDERS



Integration of 3 pillars (Education, Research & Community Services)



The Roadmap





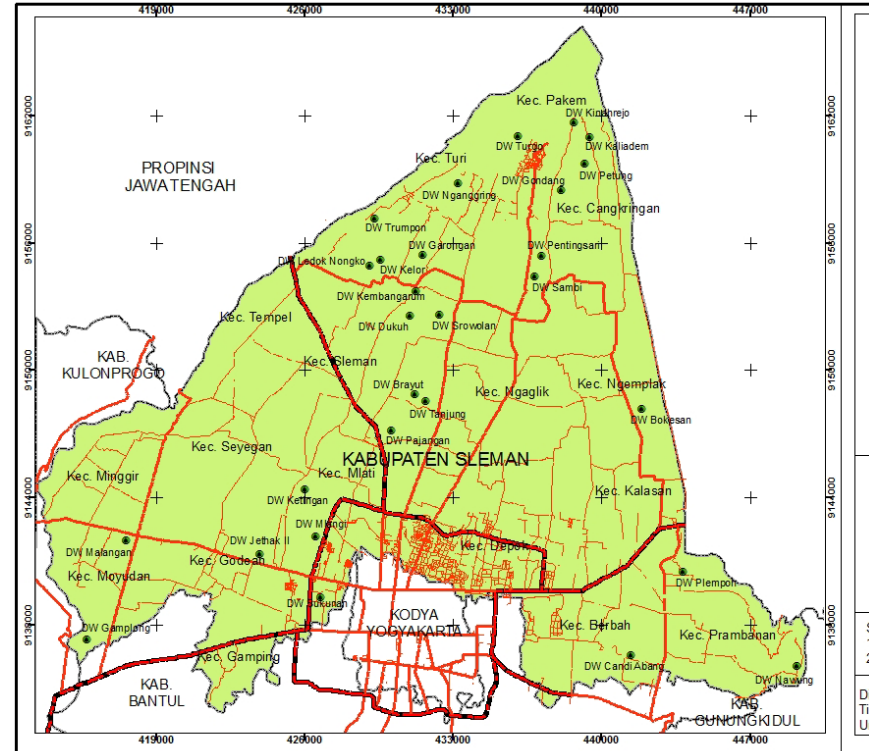
Challenges

- Sustainability
 - Operational
 - Feedstock
 - Process
 - Product quality
 - Financial
 - Economic capacity
 - Spirit
 - One strong vision
 - Active engagement of all stakeholders (according to respective responsibility)

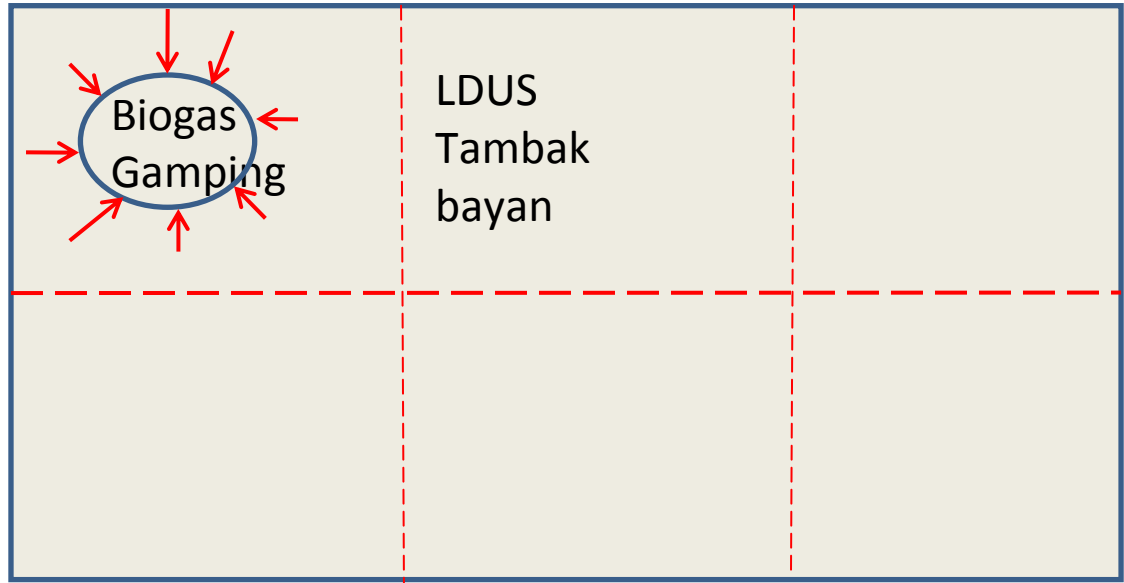
City Cluster Project

– toward zero waste society in Sleman

- Area: 574.82 km²
 - urban: 84.25 km²
 - rural : 490,57 km²
- Population : 1.1 million
- Waste generation: 3000m³/day
 - organic : 62%
 - Inorganic: 38%
- Have no landfill facility



The Concept



- Sleman is divided into several imaginary clusters
- Each cluster has one appropriate waste management system for zero waste concept
- Eg. Area surrounding Gamping Market is centralized in the Market with “waste to biogas”

The implementation

- Integrate with Gamping Biogas plant
- UGM community outreach program
 - Sorting waste at household level
 - Waste characterization – potency for biogas?
 - Other utilization and other conversion process for other waste fractions
- Recycling station – waste bank

Community Outreach Program



Thank you

