

Agricultural Diversification in a Circular Economy: Building Business-Technology Models for the Transformation of Agricultural Waste into Useful Products

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Structure of Presentation

- I. Background
- II. Objective
- III. Circular economy model
 - Waste generation
 - Waste as a resource
- IV. Business-technology models for waste:
INIPSIS Ltd a case Study
- V. Conclusions & recommendations



Background

- Diversification: “eggs in one basket”
- Dwarka (2011): investment strategy, spreading investment dollars among different areas.
- Economic diversification: income generated-different “unrelated” sources.
- Main challenges: conceptualisation & implementation (sustainability).



Agricultural Diversification

- Main model: export-oriented-crop diversification - unsuccessful.
- Failure due to highly interrelated issues:
 - inapt macro-economic policies
 - poor credit and support programmes,
 - inadequate public private partnerships,
 - inappropriate technology,
 - land distribution and tenure challenges,
 - deficiencies in marketing systems
 - management and
 - inadequate investments in agricultural infrastructure
(Demas 1987; Berezin et al. 2002; Jagdeo 2007)



Rethinking Diversification

- Diversification models in context of linear economic model- **“take-make-use-dispose”** approach:
 - Shorter product lifespans
 - Increases exposure to risks: availability-sustainability issues
 - Higher resource prices
 - Supply disruptions
- **“A Mismatch”**: For sustainability? For agricultural diversification?



Objective

To present the circular economy as an alternative to better facilitate agricultural diversification as it relates to transformation of agricultural waste into useful products.



Circular Economy

LINEAR ECONOMY



CIRCULAR ECONOMY



where the value of products, materials and resources is maintained in the economy for as long as possible, and the generation of waste minimised

Resource Efficiency: composting an option?



Resource maximisation-
Jagdeo Initiative (Jagdeo, 2007)



Resource recovery-450,000 tons/yr,
1.5 -1.8 kg/person/day(SWMCOL 2015)

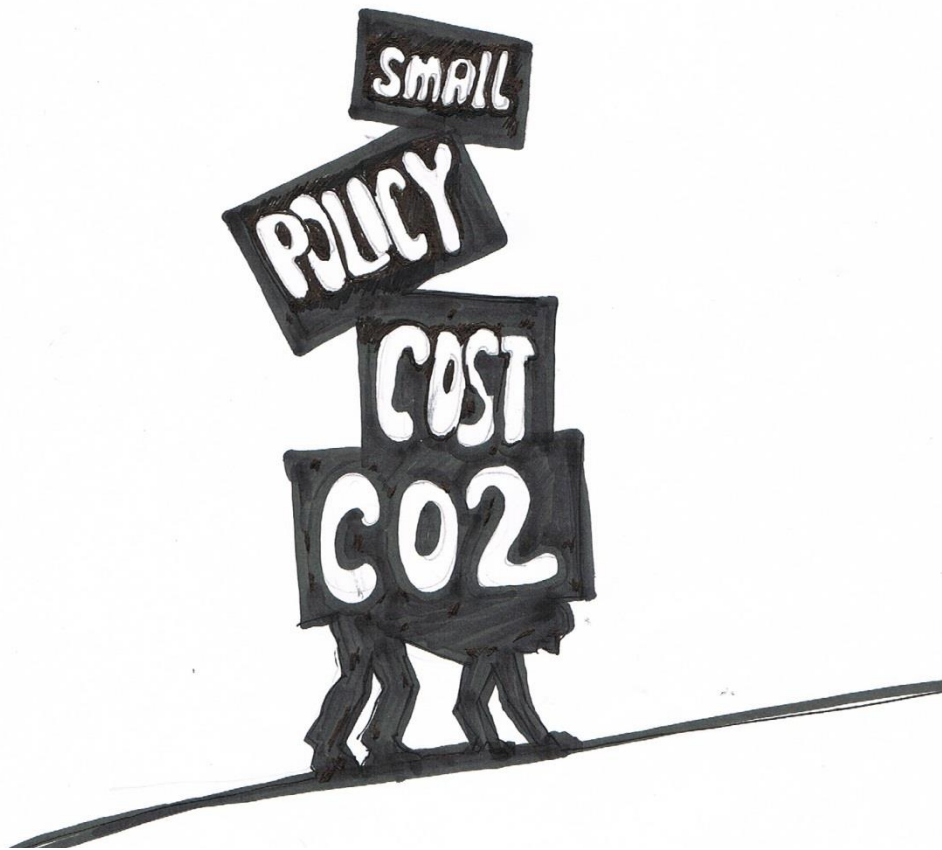


Returns on investments(> US\$ 400,000/yr)

*“Despite having some of the highest waste generation rates per capita in the world, most Caribbean countries are in the **infancy stage of all aspects of composting** including production, business, value chain, research, education, technology and community development”.*



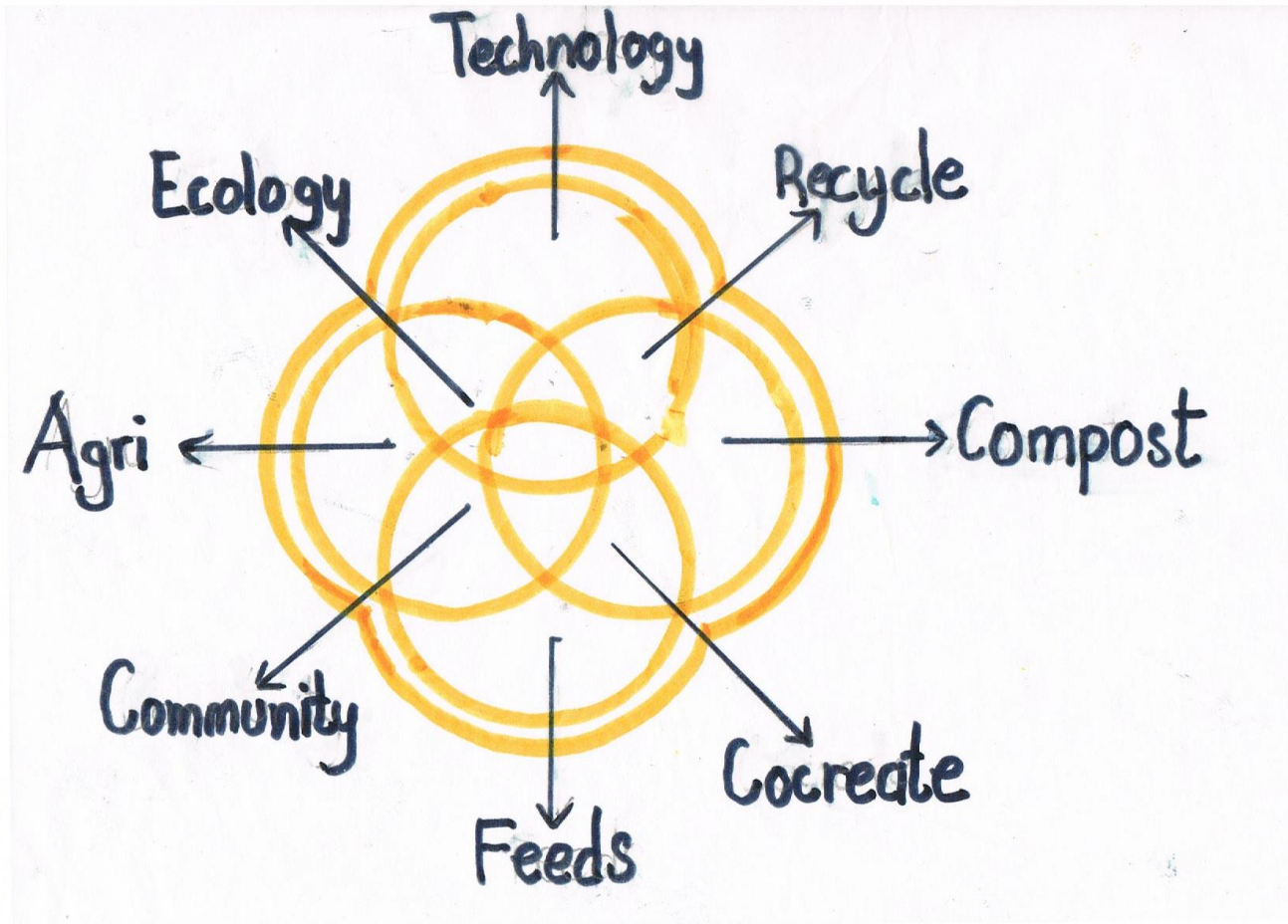
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International Network of Innovative Partners for Sustainable Intelligent Systems

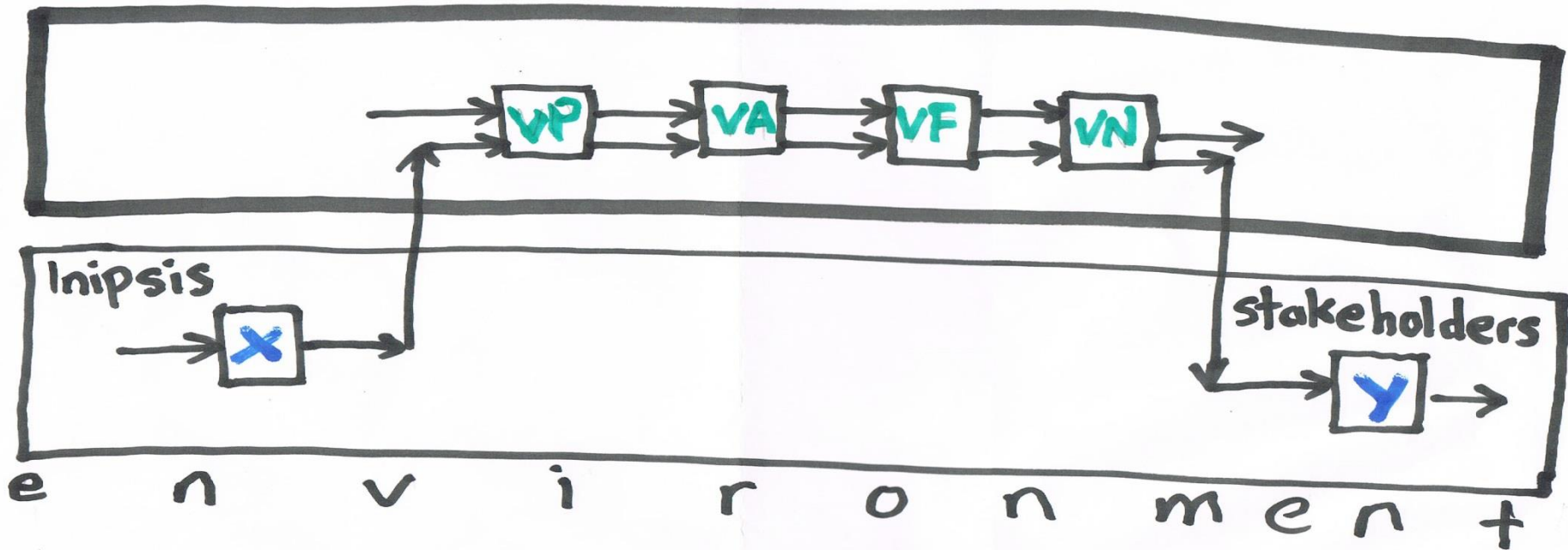


Inipsis Ltd



Building the Business-technology Model

Value Components



Value Proposition



Connected to research & innovation by...

Compost /vermicompost



Dr. Gaius Eudoxie



Mr. Micah Martin



Mr. Bryan Smith



Mr. Renaldo Belfon
Carbon Sequestration



Ms. Gem Thomas
**Stress tolerance with
soil microorganisms**

Biological Pest & Disease Control

Dr. Ayub Khan & Dr. Duraisamy Saravanakumar

Value Architecture

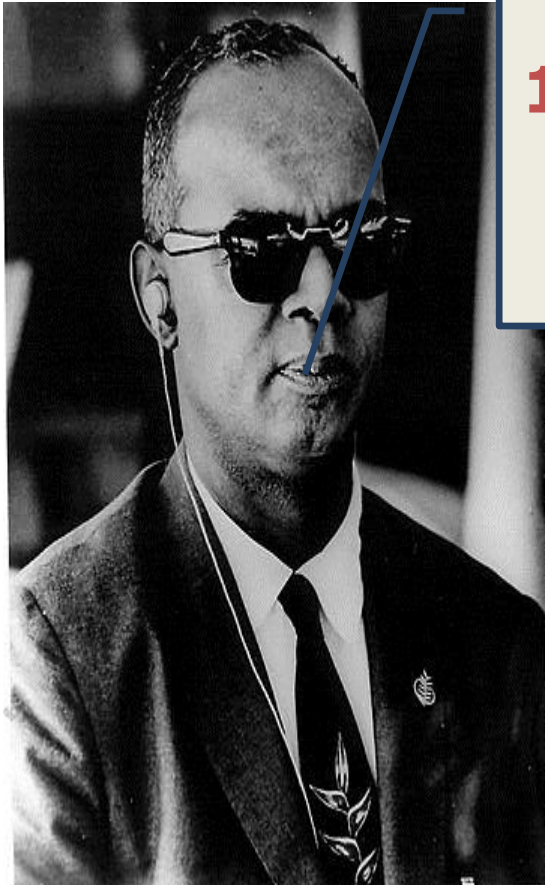


Value Finance



Value Network

Do the **math...**



$$10 - 1 = 0$$

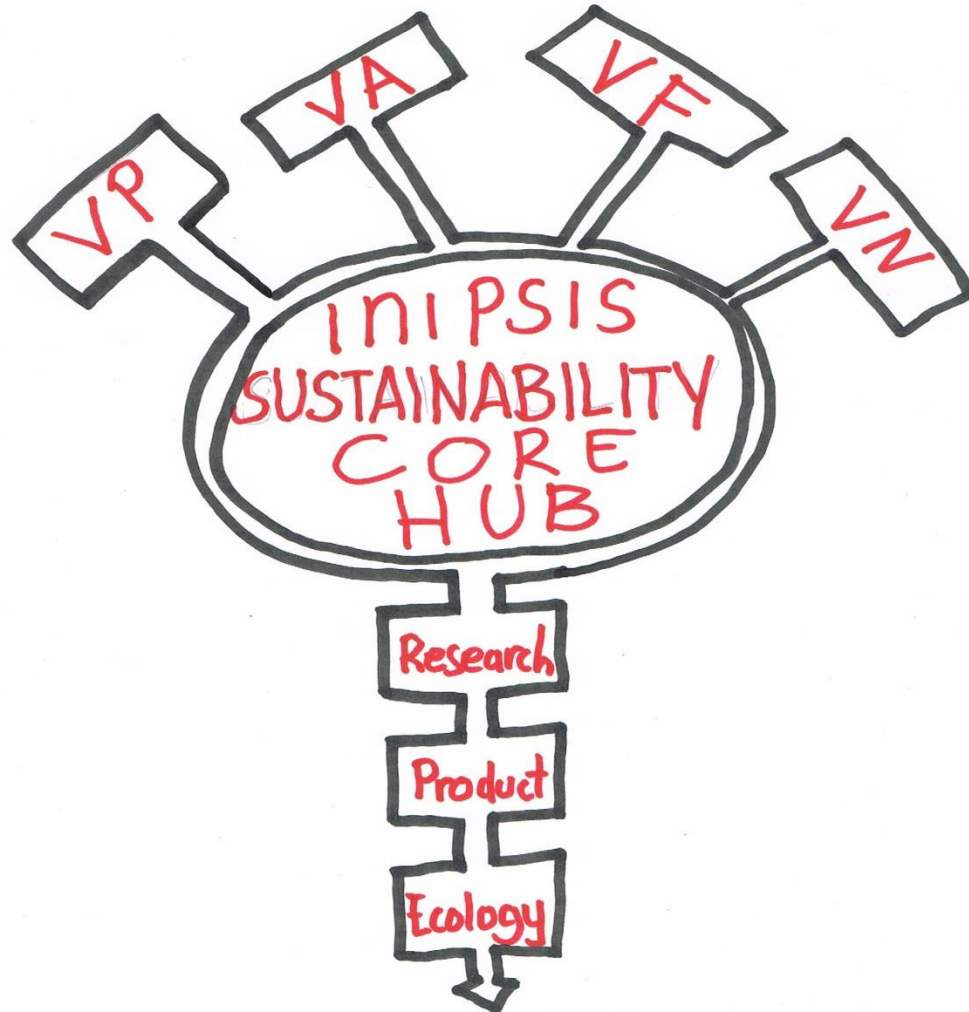


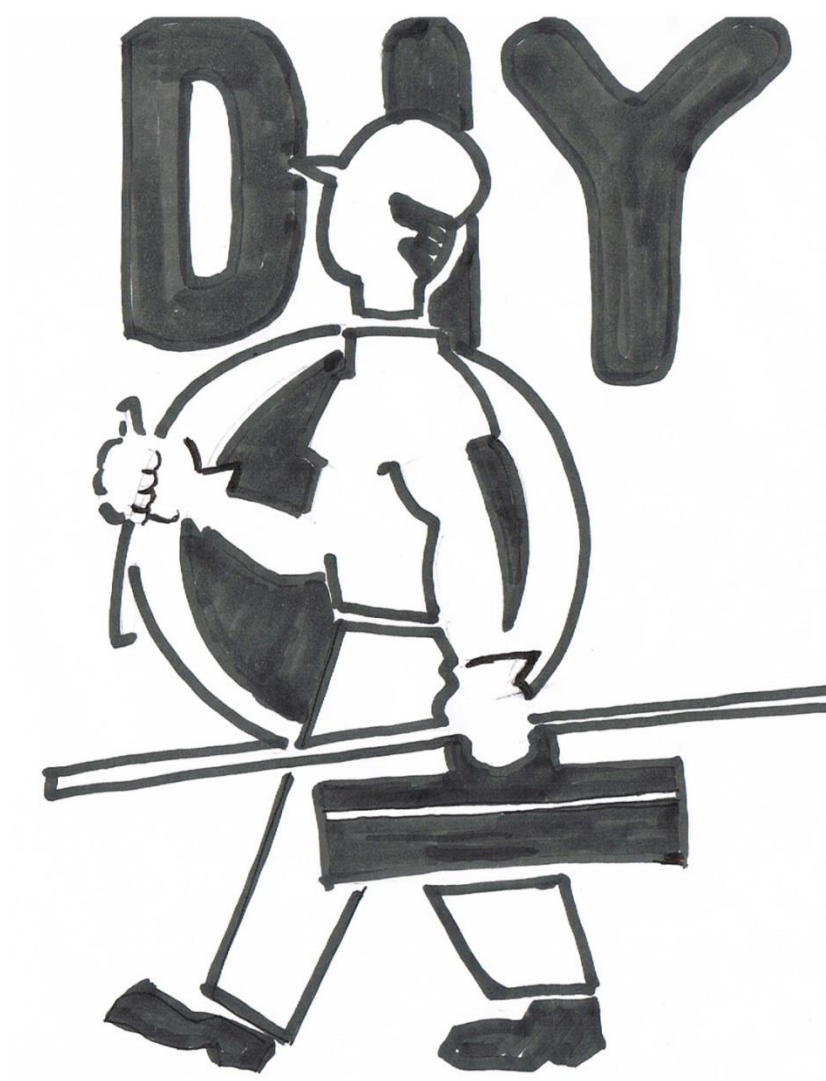
Business Research Community Development

[BRCD]



BRCD





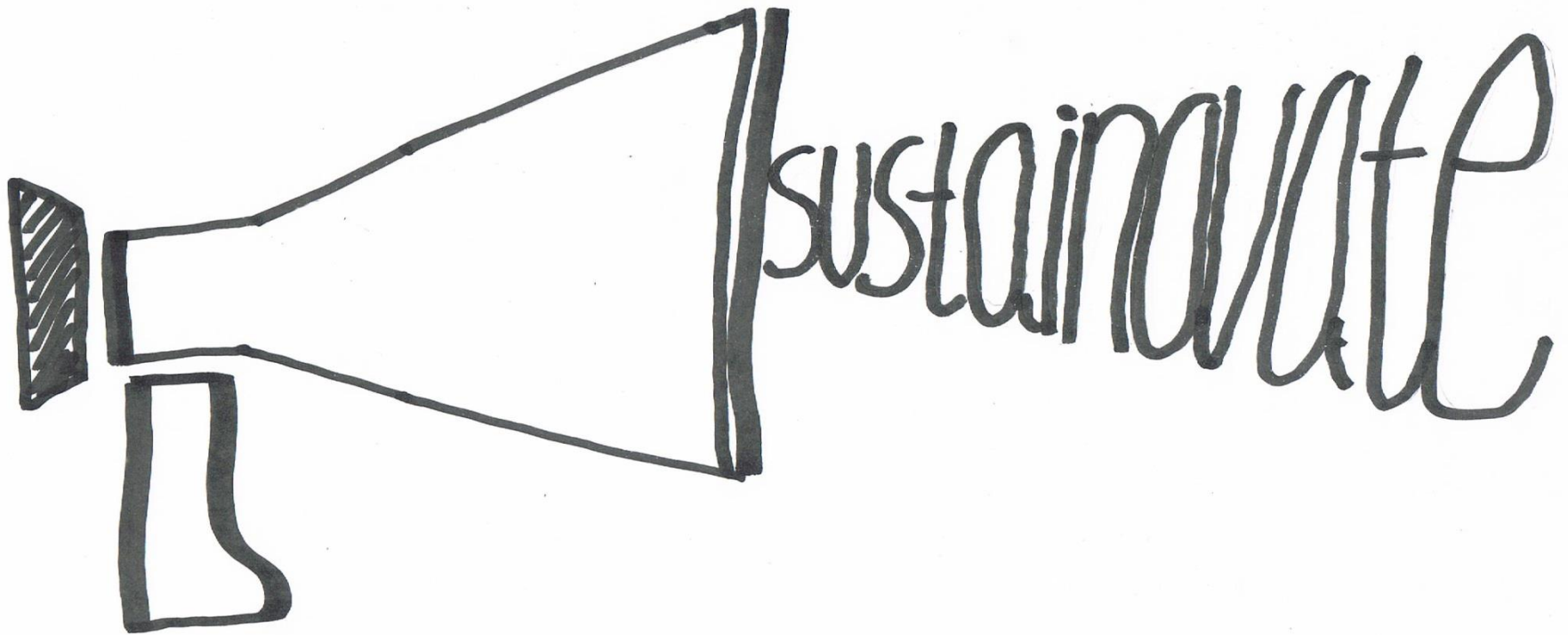
Not without its troubles...

- Consumers: freedom of choice & behaviour
- Resistance from existing business
- The rebound effect
- Managing perceptions of product obsolescence

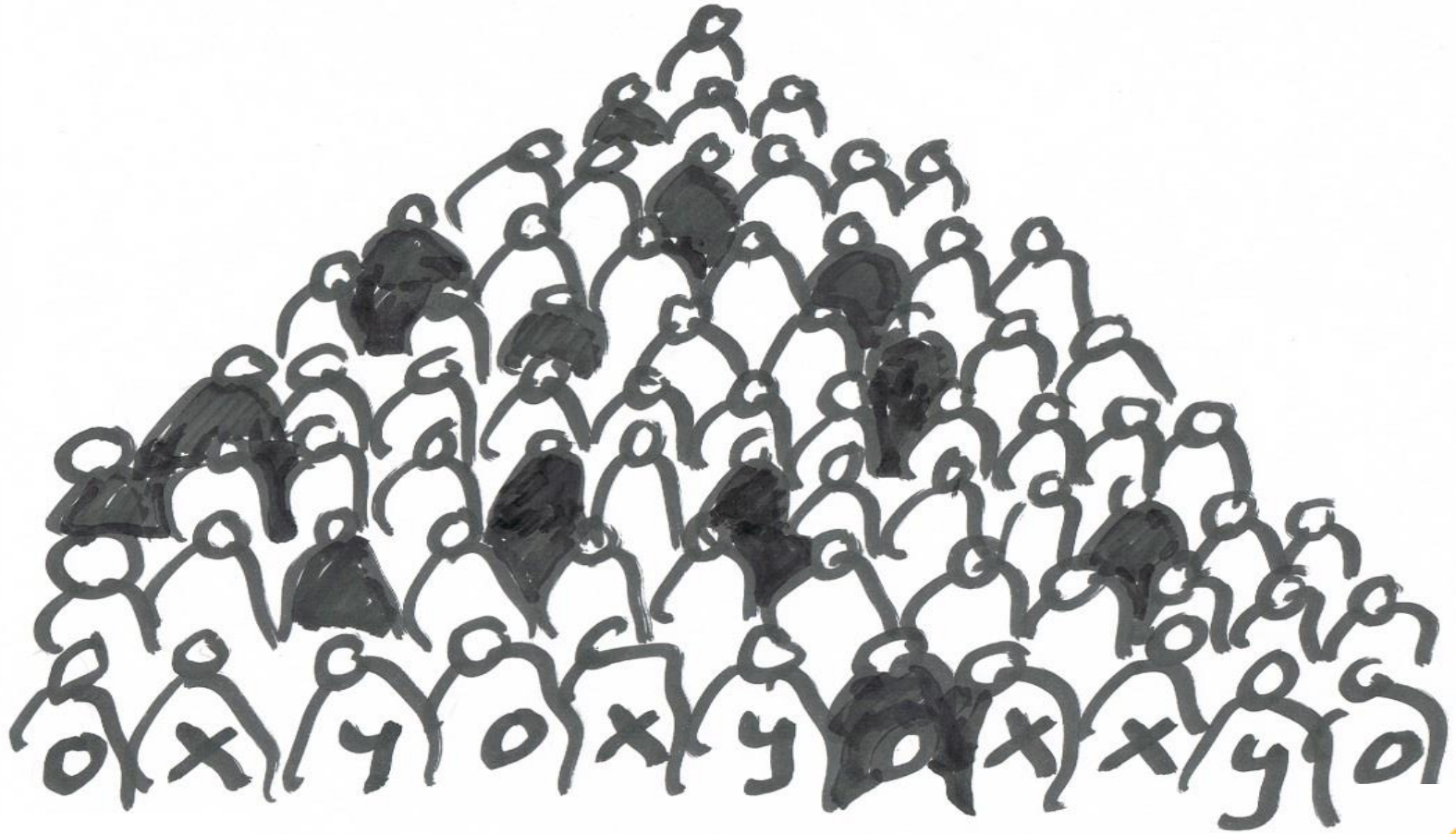
(Esposito et al. 2015; Agrawal et al. 2015)



Conclusions

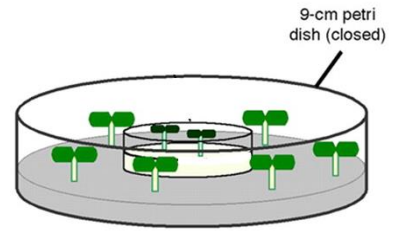


Recommendations





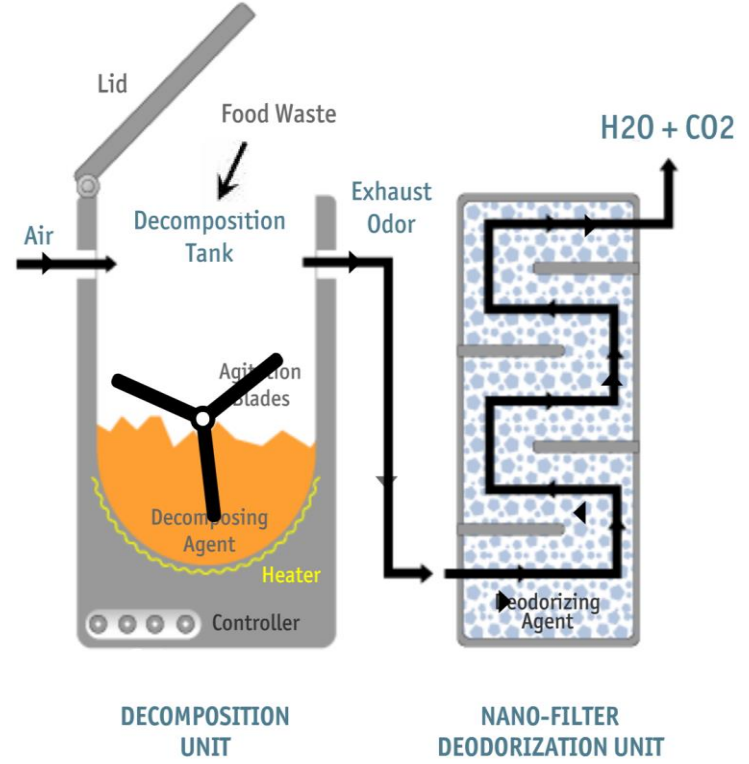
1. Biopesticide



2. Phytotoxic test



Rotary Compost Bin



3. High-rate composters.