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# Unlocking the Future: Harnessing the Power of Smart Technologies for Addressing Challenges of Local Salt Farming Processes

Can you imagine human life without SALT ?

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# Unlocking the Future: Harnessing the Power of Smart Technologies for Addressing Challenges of Local Salt Farming Processes

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OWSD and OWSD-ID, **Indonesia**

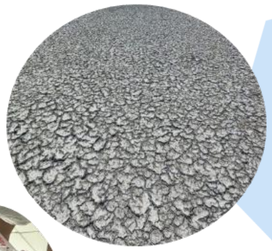
# Background


Local Salt Farm
(Samut Songkhram Thailand)

**November**

**Dry land**

Fertilizer



**December**

**Fleur salt 18-20**

Cosmetic and skin care.

**January**

**White salt 22-23**

For food

**February**

**Black salt & Magnesium 24-25**

Cleaning and antibacterial activity/ For detox .

Salt farming

- ❑ *Farmer Entirely Dependent On Nature*
- ❑ *Bad Weather Drastically Impact Salt Production*


**Salt By-Products into Therapeutic Products**

The Process Takes Long Time (4 Months)

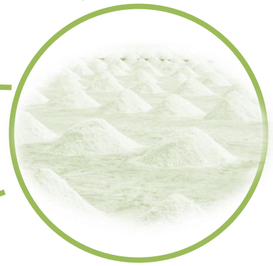
1

Non-resilient Process (Depend On Weather Conditions)

2

Limited/Low yield Products (10 % Edible and 90 % Byproduct)

3



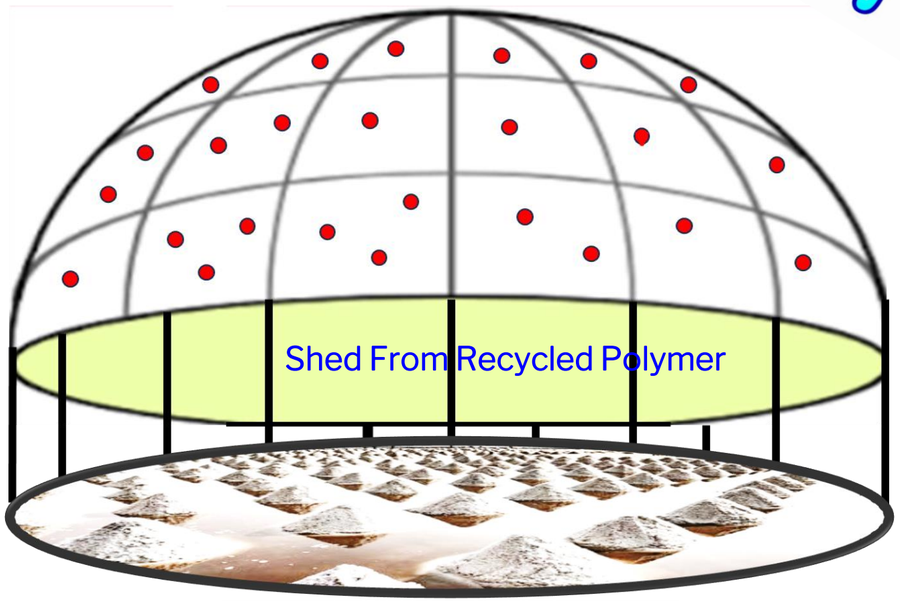
Adjustable Nanoparticle-coated Dome To Protect Salt Ponds From Wind And Rain

Salt Powered Batteries

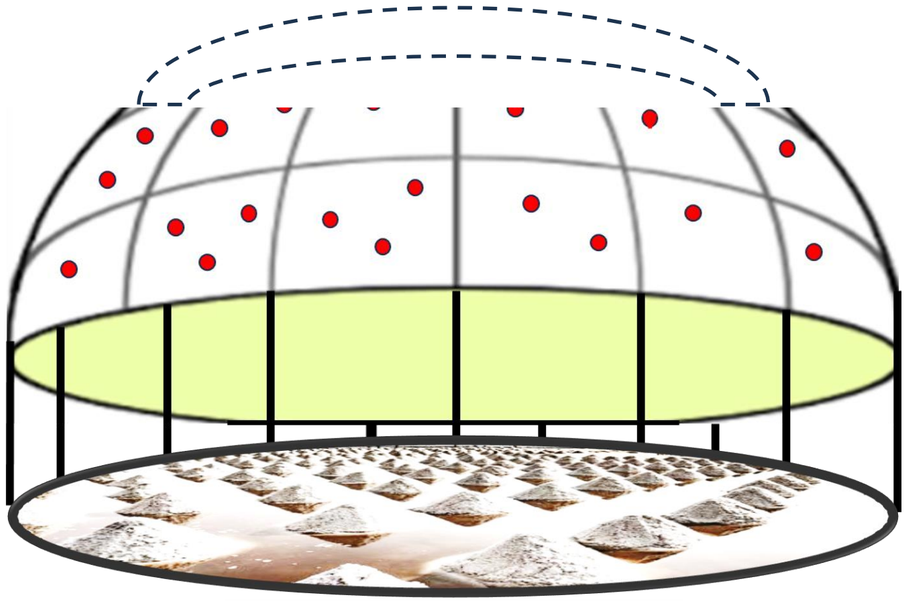
# *Smart Adjustable and Nanoparticle Coated Shed*

## Solutions

Biomass Derived Photothermal Nanoparticle Coated Shed




Smart Shed



**Biomass**

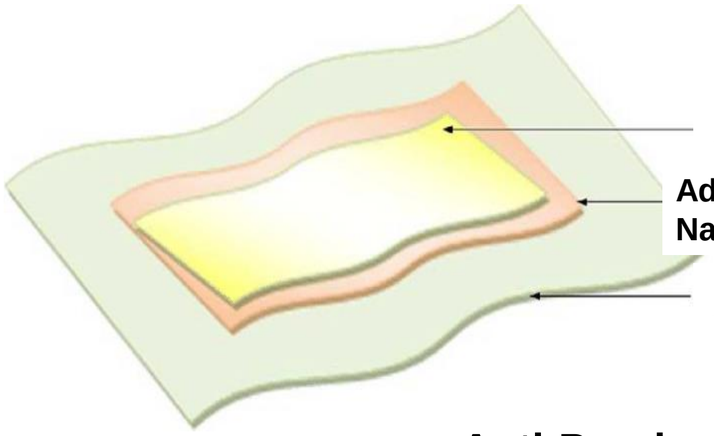
**Nanoparticle**

# 1 Value Creation

## Medical Applications of Salt Farming Byproducts

### Pain-relieving Smart Bandages/Wraps For Arthritis

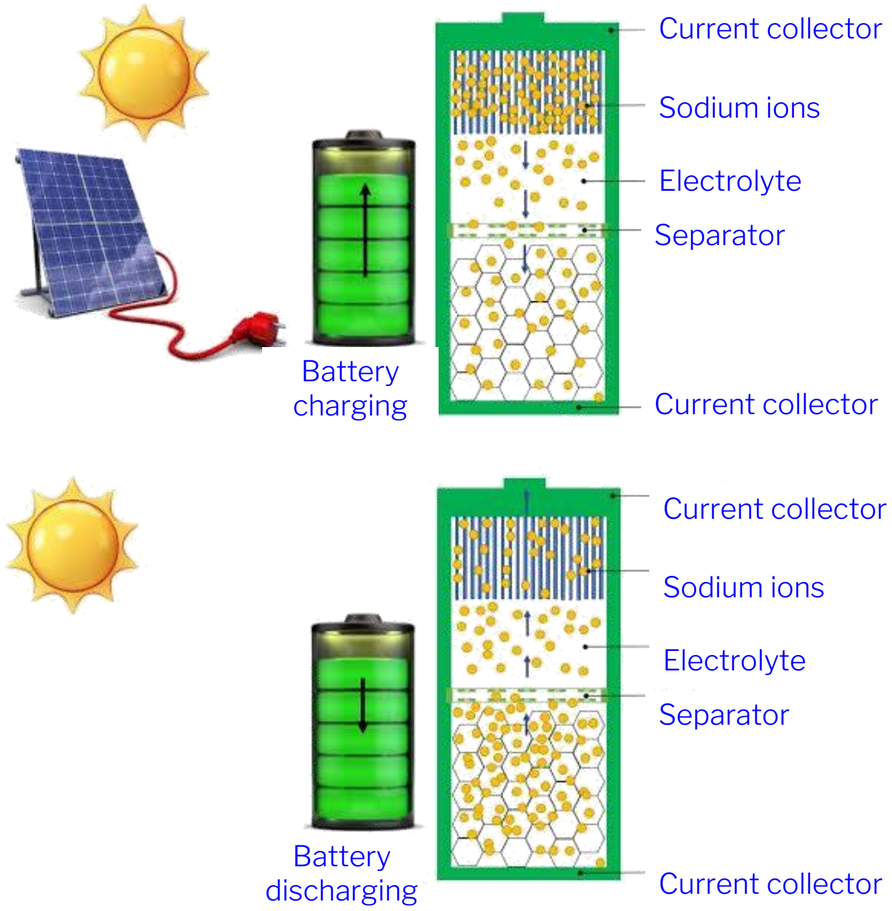

### Wound Dressing




### Anticancer Agents


### Anti-Psoriasis Agents

# 2 Value Creation



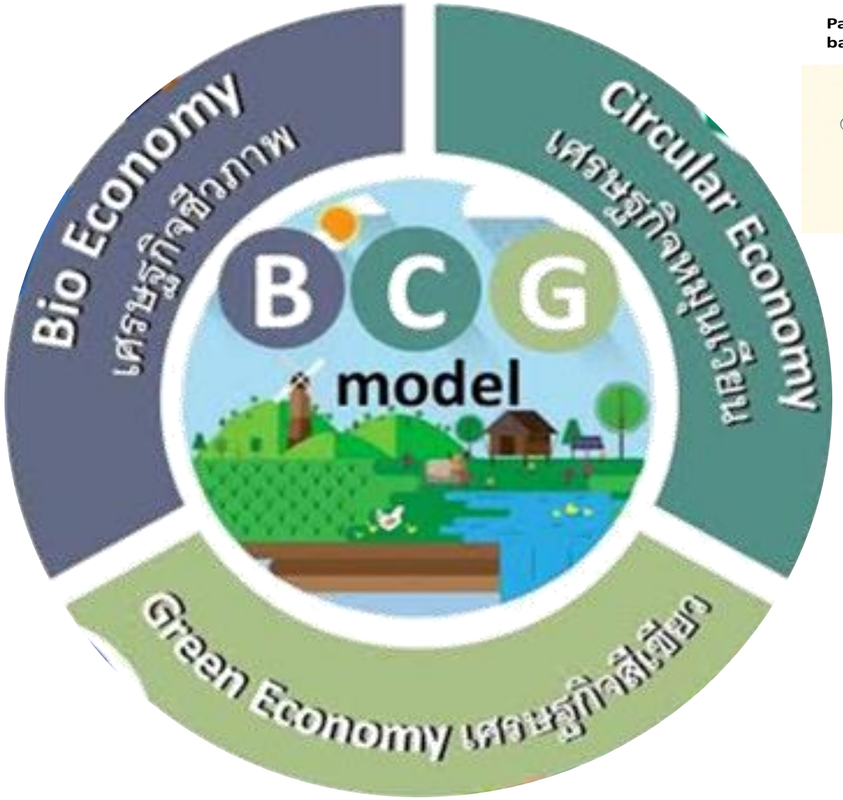

## Salt Powered Batteries

# Conclusion


- ✓ Developing Environment-Friendly Technologies for Improving Salt Production Efficiency
- ✓ Newer Value-Added Products from Intermediate Byproducts/Wastes of Salt Farming (Waste to Wealth )

# Alignment with BCG Model

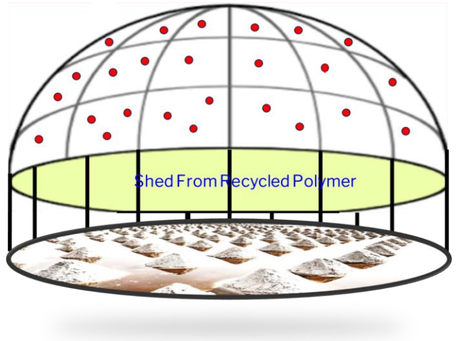
Biomass Derived Product





Solar cell

Intelligent Usage Of By-products
For Circular Economy




Eco-friendly Smart Technology

# Thank you!

*There must be something sacred in salt. It is in our tears and in the ocean*.

Khalil Gibran

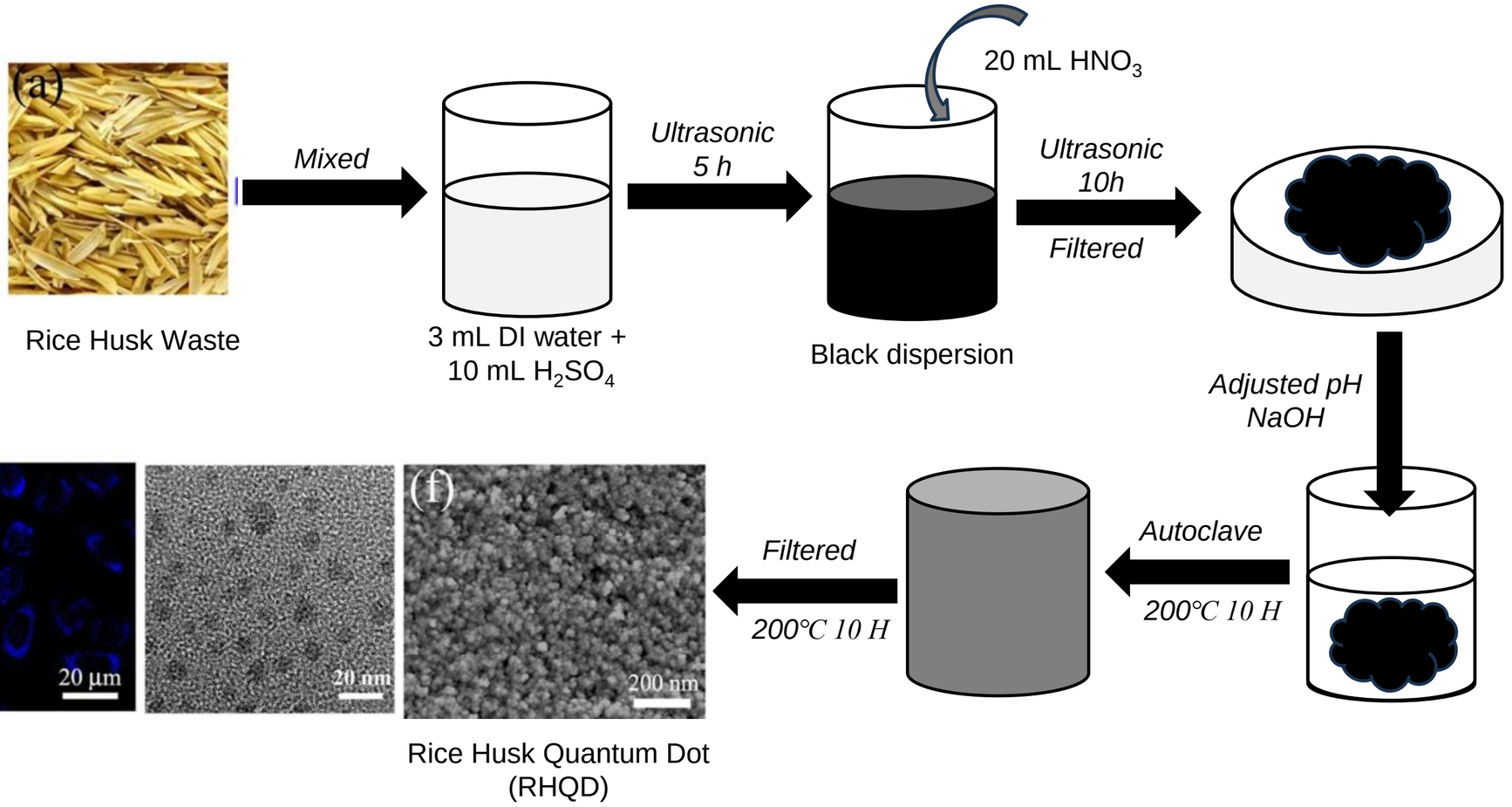
# Capacity Building from enhanced local salt farming.

Male involvement in the salt farm

Other people’s involvement-in tourism and collaboration and Global Networking

Female- involvement in medical product processing and salt collection

# RHQD synthesize process



# Investment analysis

## Materials

**Bamboos ($66)**
**Screws ($18)**
**Polymers ($135)**
Total Less than ($ 220)/64 square meter

## Lifetime

salt farmer can reuse the sheds and reassemble it (lifetime of polymers more than 200 years) .

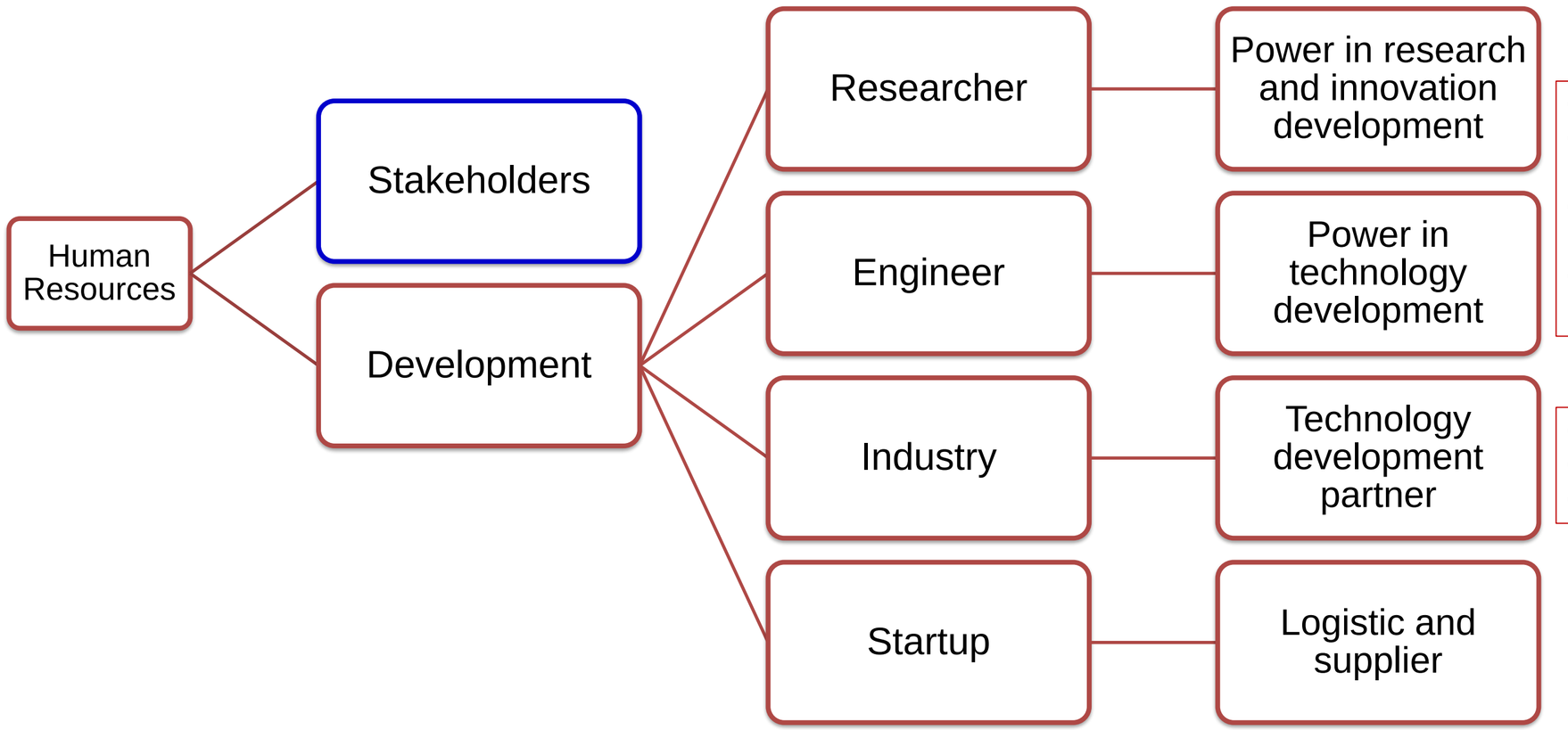
## Assembly

Three salt farmer with minimal training should be able to assemble it.

## Productivity

It can improve productivity compared with traditional technology. ( compare with producing salt every 4 months)

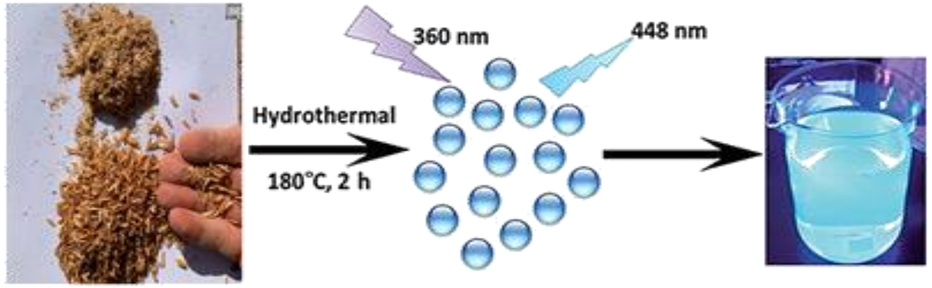
# Resources

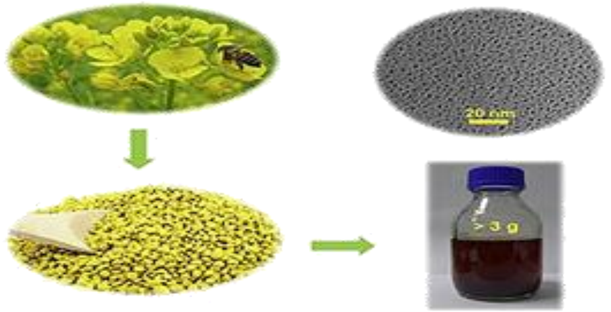


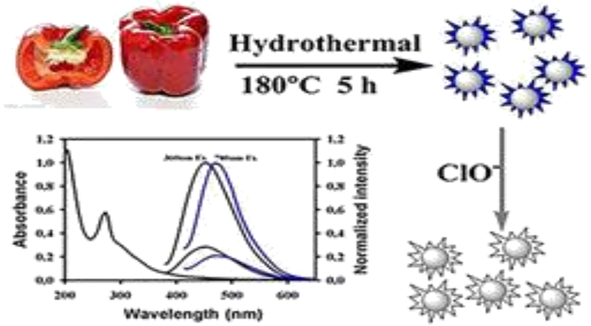

- Ifakara Health Institute, IHI-Tanzania
- Institute of Nano Science and Technology, Mohali, India
- hydrogen technologies institute, KACST, Saudi Arabia
- Research Center for Chemistry, BRIN Indonesia

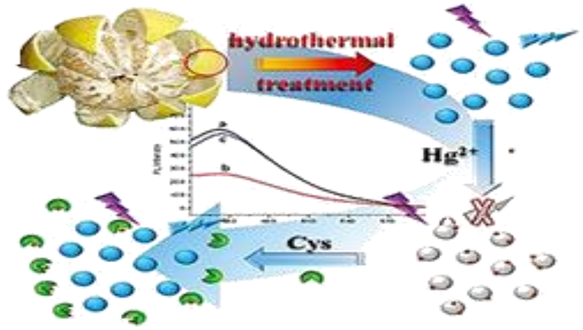
- Farma Industry
- Energy Industry
- Plastic Industry

# Biomass Derived Photothermal Nanoparticle




# Preliminary design of a low-cost greenhouse for salt production in Indonesia

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[4]Kencana Tiara Gemilang, PT, Malang 65153, Indonesia

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**Abstract.** Salt is an assential material of industry, not only in food industry point of view but also in various industries such as chemical, oil drilling, and animal feed industries, even less than half of salt needs used to household consumption. It is crucial to ensure salt production in Indonesia reaches the national target (3.7 million tons) due to relatively low technology and production level. Thus salt production technology is developed to facilitate farmers consisted of geomembrane and filtering-threaded technology. However, the use of those technologies in producing salt was proved less effective due to unpredictable weather conditions. Therefore, greenhouse technology is proposed to be used for salt production for several good reasons. This paper describes the preliminary design of a low-cost greenhouse designed as a pyramid model that uses bamboo, mono-layer and high density polyethylene plastics. The results confirmed that the yield of salt produced by greenhouse significantly incresed compared with prior technology and the NaCl content increased as well. The cost of greenhouse was IDR 5,688,000 and easy to assembly.

**Figure 1.** Bamboo framework of a low-cost greenhouse.

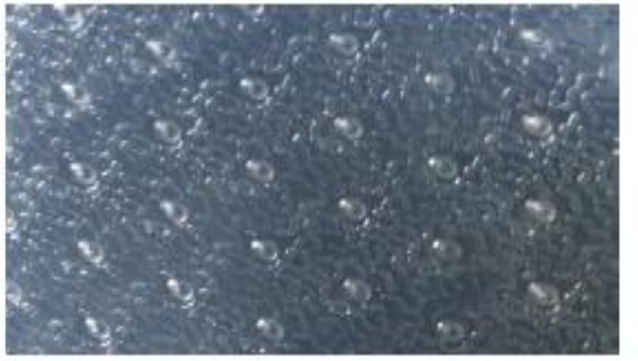


**Figure 2.** UV plastic with 14% reducing sunlight intensity.

**Table 2.** Field testing results in producing salt.

| Parameters | Value |
|---|---|
| Average temperature | 45 °C |
| Productivity | 150 kg/ha |
| Sodium chloride/NaCl | 95 % |
| Colour | white |

# How much does a Growing Dome cost?

You are wondering how much do they cost? The base price for a Growing Dome greenhouse kit ranges from about $9,990 for a 15-foot diameter dome to about $48,950 for a 42-foot diameter dome. All of our sizes and prices can be found here. These prices do not include Shipping, Installation and Owner Supplied items. You will also need to add your raised beds, soil or talk to us about Customization options.

**GERMANY's Covestro, a US$12.3 billion material science company that makes some of the world's strongest coating and adhesives, is promoting the benefits of what it calls a breakthrough product that can boost the incomes of farmers and fishermen in Thailand.**

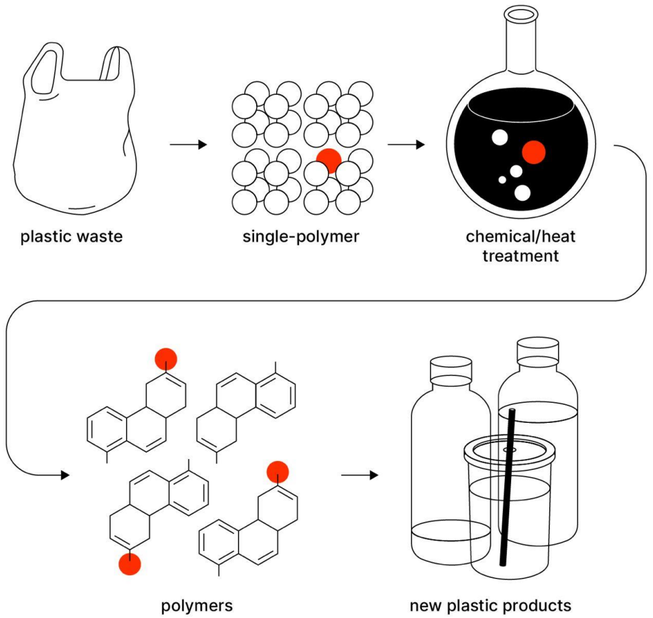
**Table 3.** Investment analysis of a lo-cost greenhouse technology.

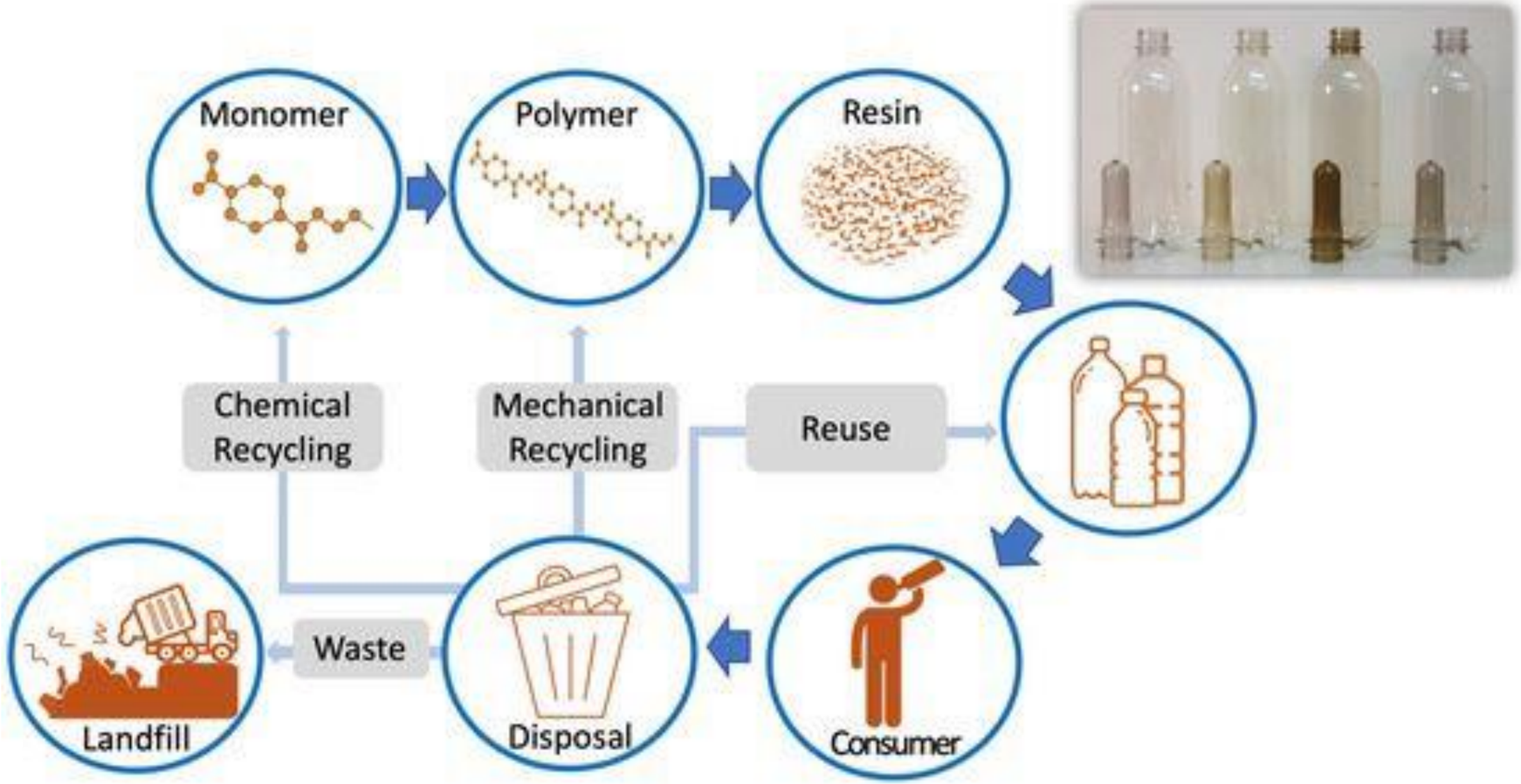
| Materials | Lifetime | Total | Price per items (IDR) | Total (IDR) |
|---|---|---|---|---|
| Screws | 5 | 800 pcs | 350 | 280,000 |
| Bamboos | 5 | 20 pcs | 50,000 | 1,000,000 |
| labourage | - | 3 people | 200,000 | 600,000 |
| Geomembranes | 5 | 15 kg | 119,000 | 1,785,000 |
| UV plastics | 5 | 17 kg | 119,000 | 2,023,000 |
| | | | Total | 5,688,000 |

The benefits of the low-cost greenhouse of salt production, as follows:

- Greenhouse costs: Less than IDR 5,688,000 for an affordable greenhouse with a minimum planting area of 64 square meter.
- Ease of assembly: Three individuals with minimal training should be able to assemble the greenhouse from the ground-up in a day.
- Lifetime: Minimal lifetime of five years for the greenhouse structure and five years for the glazing; only limited maintenance should be required by the salt farmer.
- High productivity: It can improve productivity compared with traditional technology.
- Purity of salt: Sodium chloride can reach more than 95%.

300 USD


plastic waste
single-polymer
chemical/heat treatment
polymers
new plastic products


Monomer
Polymer
Resin
Chemical Recycling
Mechanical Recycling
Reuse
Waste
Landfill
Disposal
Consumer

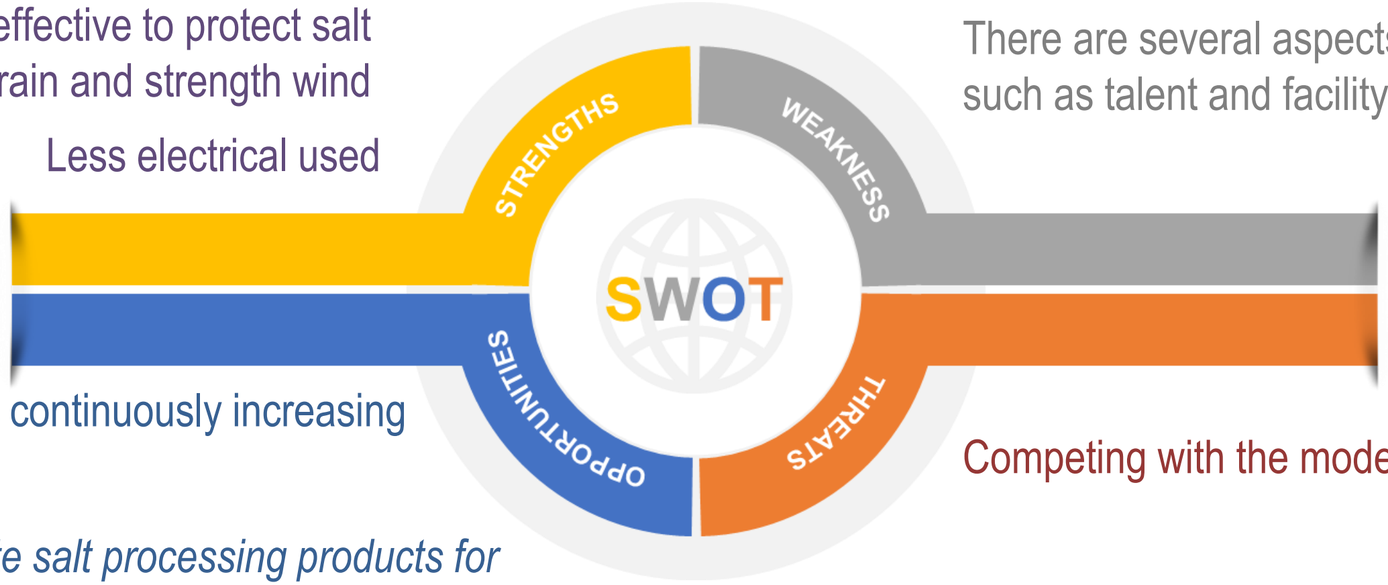
# SWOT ANALYSIS

Sustainable biomass resources

Scale up the NPs-based biomass is feasible

A glass dome is effective to protect salt ponds from rain and strength wind

Less electrical used




There are several aspects that need to be developed, such as talent and facility development

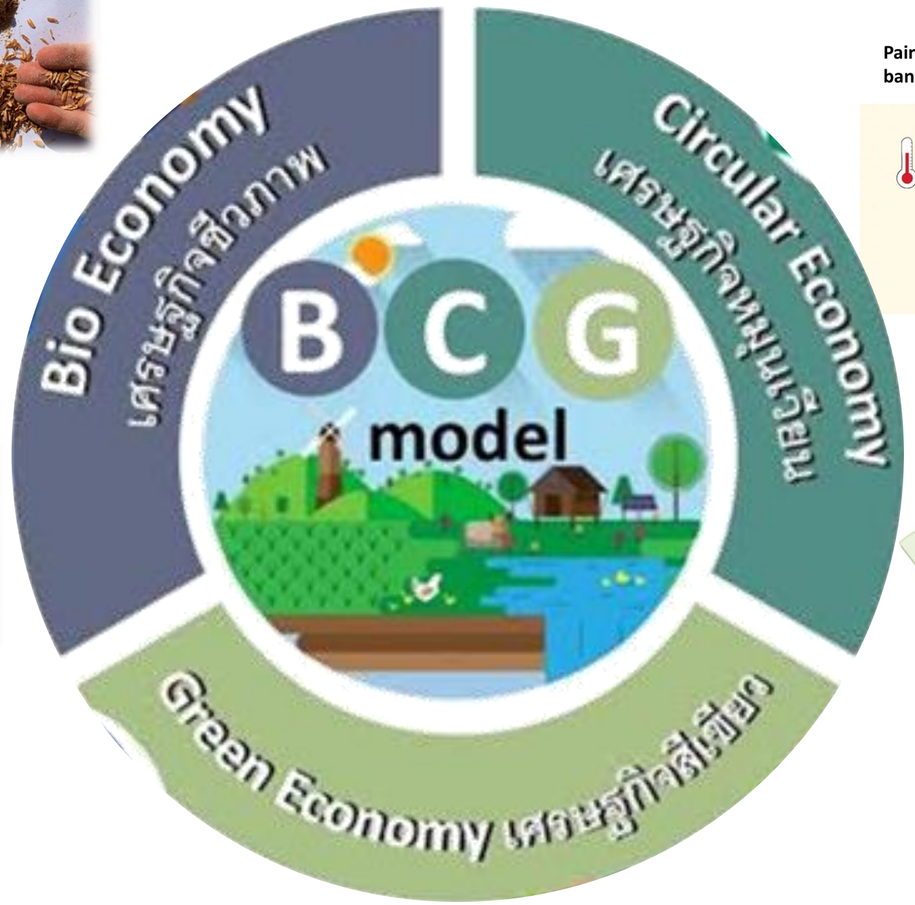
Salt products demand is continuously increasing

Competing with the modern salt industry

*The utilization of intermediate salt processing products for medical fields application is wide*

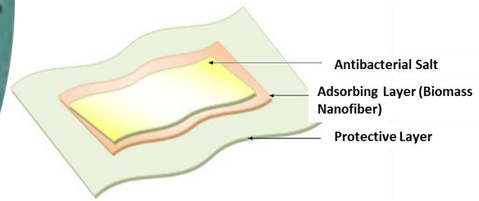
Open the opportunities for collaboration in technology development and utilization of processed product outcomes

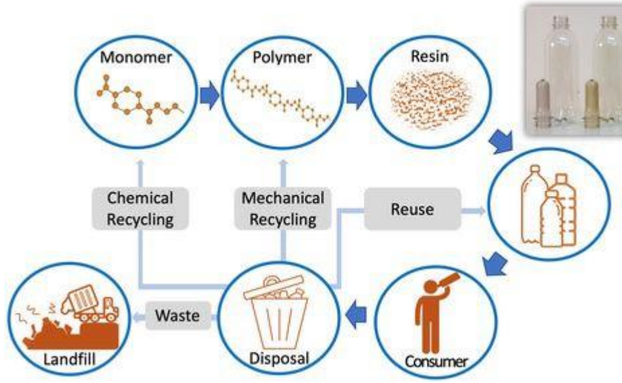
# Outcomes and Conclusion




Pain-relieving smart bandages/wraps For Arthritis

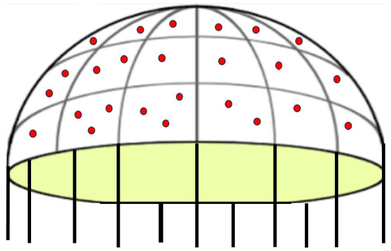
Wound Dressing




Anticancer Agents


Solar cell



The process took long time

4 months

Food and agriculture

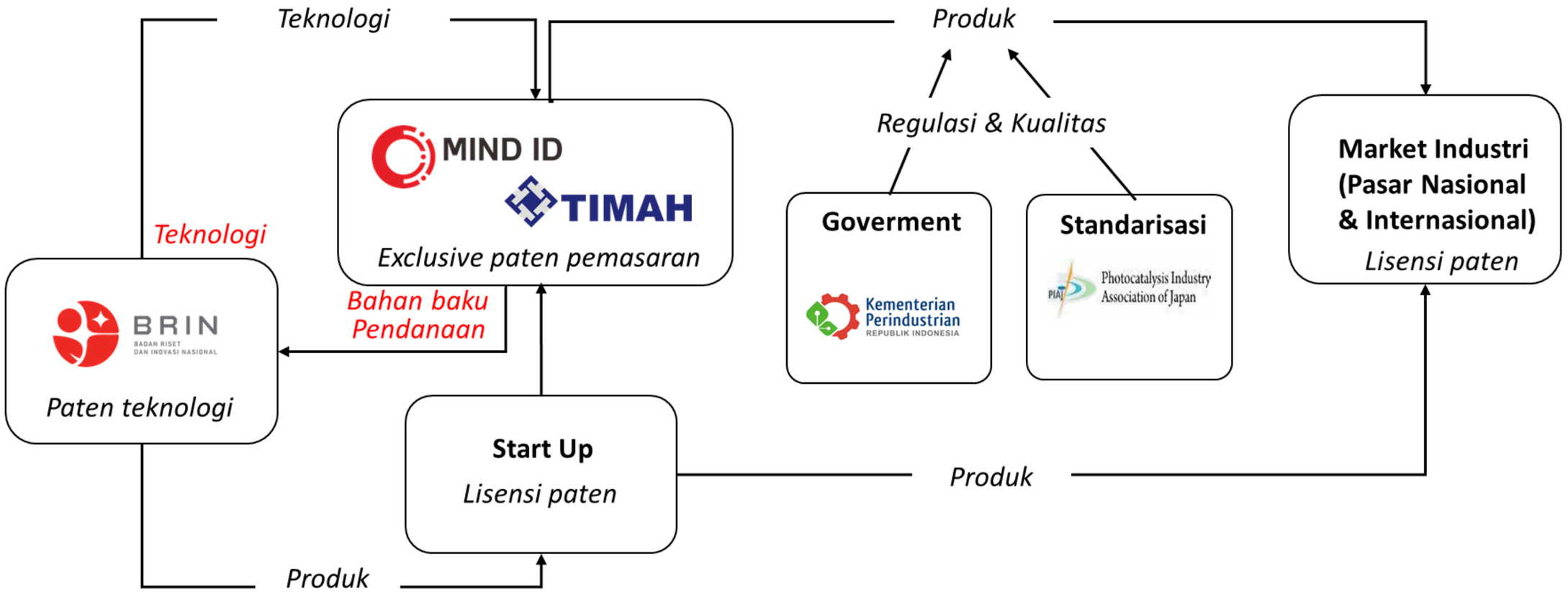
Bioenergy, biomaterial and biochemical

BCG

Medical and wellness

Tourism and creative economy

# Skema Bisnis



# Steps of salt farming


(

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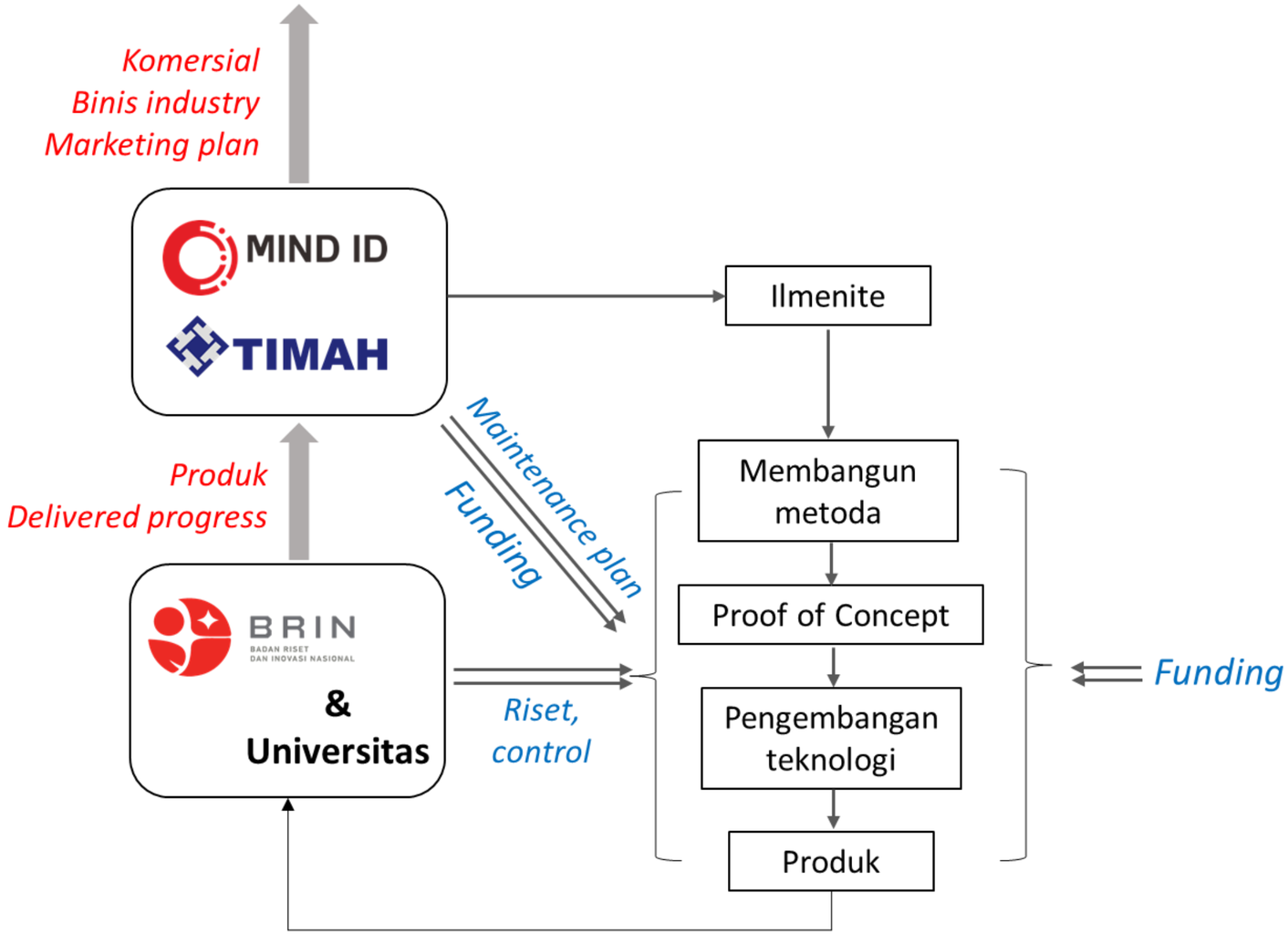
ack salt
rtilizer)

# Strategi Kunci dan Implementasi




- Pengembangan teknologi membutuhkan multidisiplin keilmuan
- Peningkatan benefit dapat dicapai dengan persiapan mitigasi yang jelas
- Penentuan market industri yang tepat
- Melibatkan stakeholder dan Lembaga terkait dalam proses penjualan produk

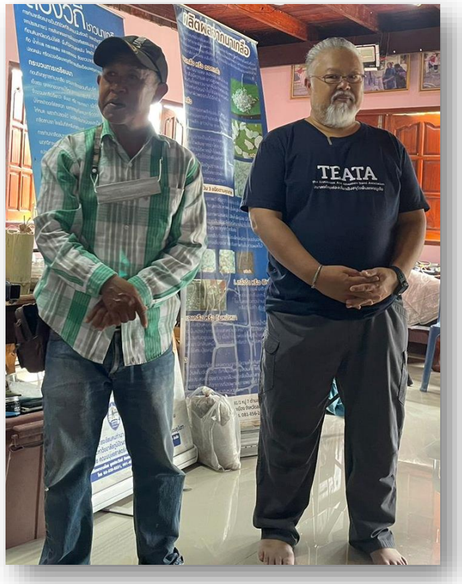
# Background

26,977 rai farmed by 490 families from Samut Sakhon and near areas.

Price salat for A-grade is 10 baht/kg, B-grade 5 baht/kg, C-grade 2.5 baht/kg, Inferior quality 30—40 baht/sack.

90% of salat is for industrial businesses 10% is table salt.

Local Salt Farm
(Samut Songkhram Thailand)




Salt farming Production

- Farmer completely dependent on Nature
- Bad weather is drastically impacting salt farming production