

# YOUTH CLIMATHON

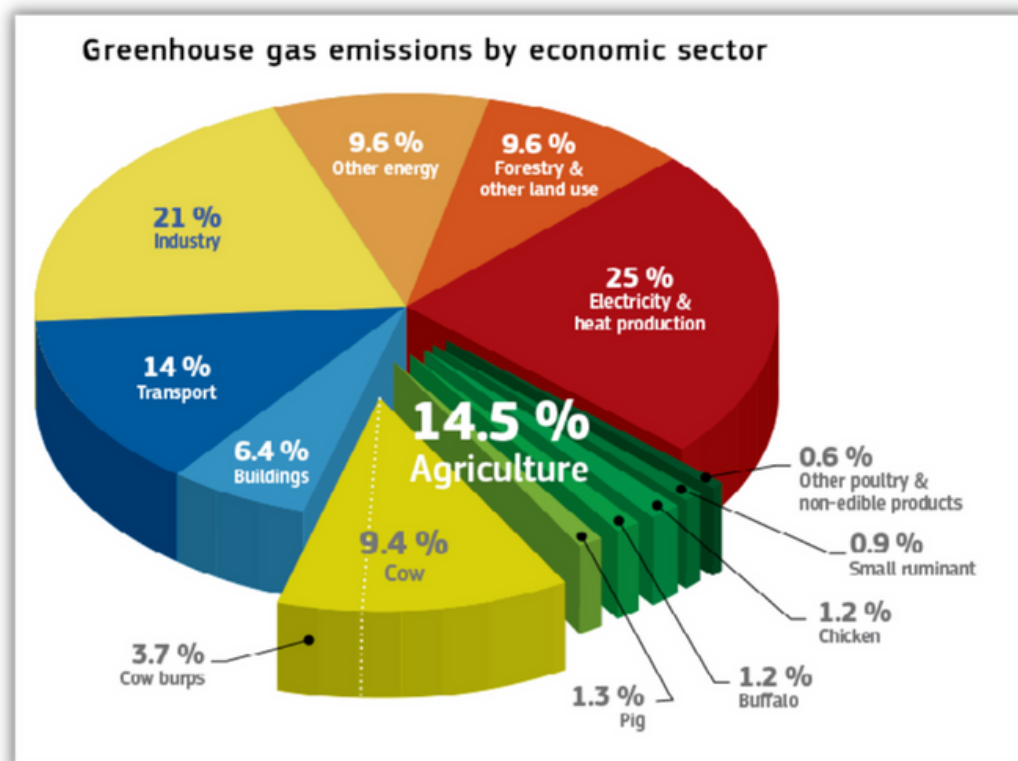
*INNOVATIVE SOLUTIONS FOR THE ACCELERATION OF CLIMATE ACTION  
IN ASIA & THE PACIFIC*

**13** CLIMATE  
ACTION

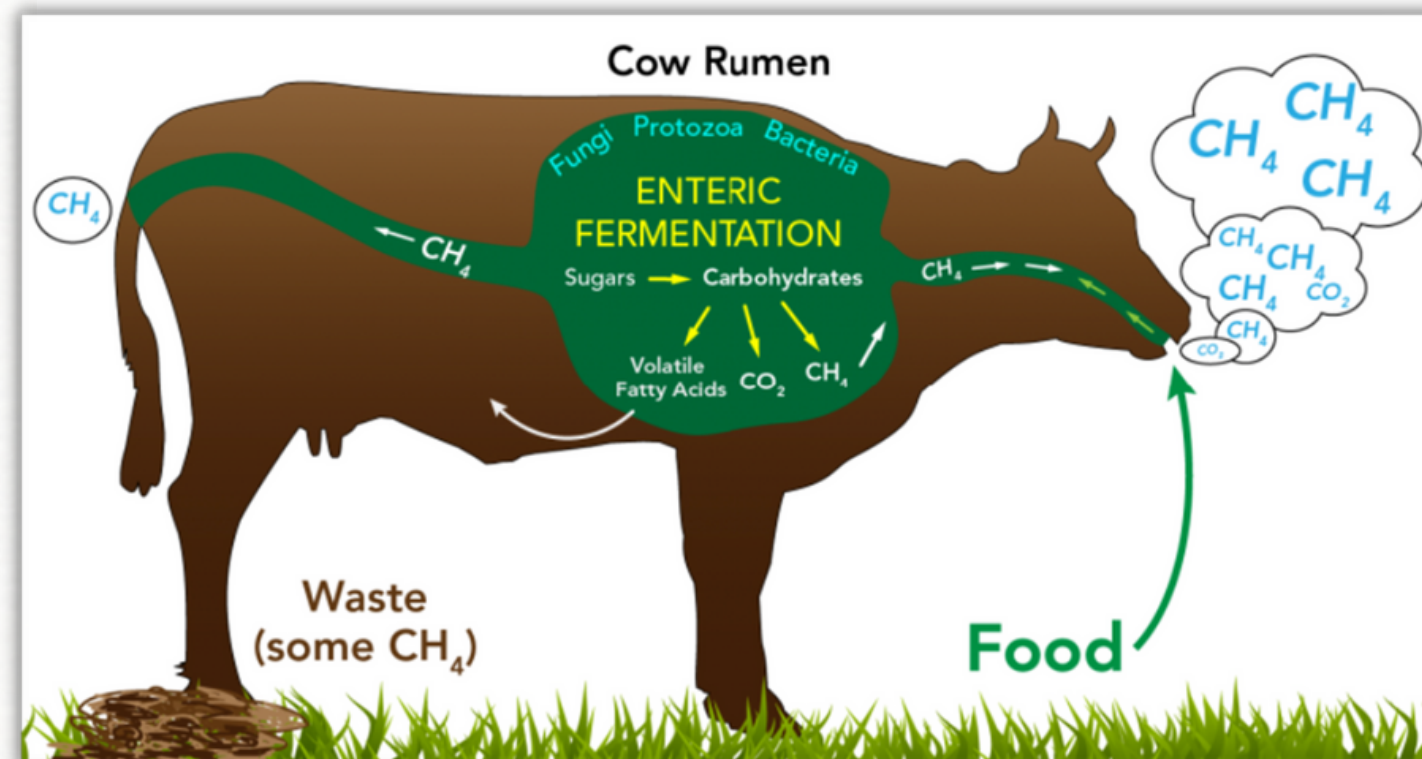


**Nature based solutions: Wuluh Starfruit Leaf (*Averrhoa bilimbi* L.)  
Extract as Feed Additive Cow to Reduces Methane Gas Emissions to  
Achieve Sustainable Agriculture and the 13th SDGs "Climate Action"**

# Problem



source: European Commission



One of the factors causing climate change is global warming. Global warming can be caused by rising greenhouse gas emissions, including methane gas. The gases, most of which accumulate in the atmosphere, are contributed by the agricultural sector, especially **livestock**.

**THERE ARE**  
**CO**<sub>2</sub>**nsequences**



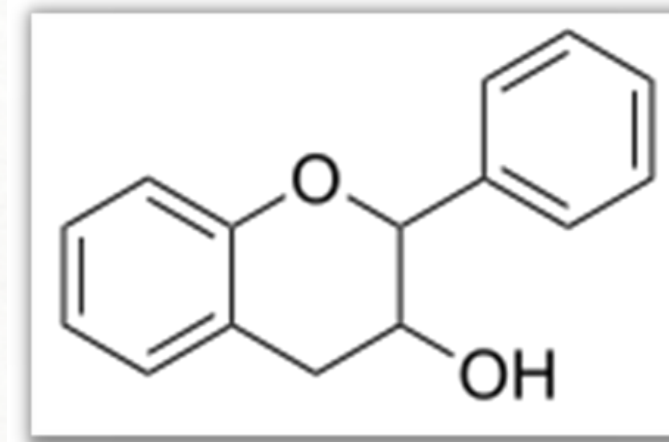
## How **Climate Change** Will Impact Our **Nature, Biodiversity** and **Ocean**

Climate change delivers severe heat waves, loss of Plant species, loss of insect species, loss of coral reefs & decline in marine fisheries, and sea level rise by the year

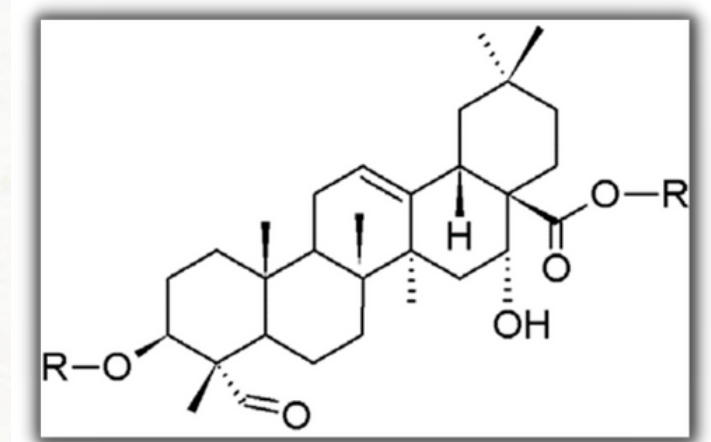
## Solutions



Star fruit leaves contain secondary metabolite compounds, such as alkaloids, phenols, triterpenoids, flavonoids, **tannins**, and **saponins** (Yanti and Vera, 2019).



Tannin



Saponin

**What it Does:** Tannin functions like a natural "blanket" for nutrients in a cow's stomach.

**How it Works:** When cows consume food, microbes in their stomachs generate methane as a byproduct. Tannin acts as a protective layer, covering nutrients from the feed and shielding them from microbes. This mechanism prevents the nutrients from transforming into methane gases during digestion

**What it Does:** Saponin acts as a skilled "hunter" within the cow's stomach.

**How it Works:** When saponin is present, it operates like a precise hunter, targeting and eliminating specific microbes. This targeted action disrupts the usual process where gases build up and are released as methane.

## Result & Conclusion

High levels of **tannins 15.52%** and **saponins 8.4%** (Adiwibowo et al., 2020). cause wuluh starfruit leaves to potentially feed additives that can reduce methane gas production. Based on this, the use of wuluh starfruit leaves (***Averrhoa bilimbi L.***) as feed additive is a solution to reduce methane gas production in ruminants metabolism



Wuluh Starfruit (*Averrhoa bilimbi L.*)  
Leaf Extract as Powder

**\*The extract powder will combined with cow's feed with balance and precision dosage**

# Target Group

Our project primarily targets villages that have small to medium scale cow farmers in their area. Empowering them to utilize Wuluh Starfruit leaves as food additive will help them in:

1. **Enhancing the cow health** by modifying its digestion system.
2. Combating global warming by **reducing the number of methane gas emission**
3. Improving the **well-being of village populations** by removing the pollution and creating job opportunities in food additive production plant.



## Environmental Impact

**20%** reduces  
methane gasses  
**350,000** tons CO<sub>2</sub>

We anticipate significant positive environmental outcomes. Our estimations suggest a projected reduction of approximately **20%** in methane gas emissions from the livestock sector within the first two years of implementation. This corresponds to an estimated decrease of around 350,000 metric tons of CO<sub>2</sub>-equivalent emissions annually.

**Better Animal  
Product**

**Better Nutrition**

**Better  
Environment**

**Better Life**

## Social Impact

**60+ jobs/village**  
**~150 USD/person/month**  
**12% of rural population**  
**impacted with better**  
**economy**

### Empowering Rural Families Through Feed Additive Industry

Not only good for the climate, our food additive plant project creates green jobs for local communities, fostering sustainable livelihoods and reducing poverty.

Additionally, eliminating gas population will lead to better health outcomes. We will measure social impact through job creation rates, community surveys, and health data analysis.

# Cost Considerations

## Initial Investment:

- **Research and Development for Wuluh Starfruit Leaf Extract: \$2,000**
- **Cultivation of Wuluh Starfruit Trees: Cost varies based on the scale of cultivation**
- **Extraction Equipment: \$500–\$1,000**

## Training:

- **Workshop on Wuluh Starfruit Leaf Extract Production: \$100–\$200 per participant**
- **Educational Outreach on Sustainable Agriculture: \$50–\$100**

## Ongoing Costs:

- **Harvesting and Processing Labor: Variable cost based on production volume**
- **Quality Control and Testing: \$200–\$300 per batch**
- **Packaging and Distribution: Variable cost based on the distribution network**

# Implementation Plan

## Initial Planning and Preparation

Completed action 1 : Assess the potential of Belimbing Wuluh leaves as a feed additive through laboratory tests.

## Small Scale Production and Initial Evaluation

Completed action 3: Small-scale production of feed additives to ensure quality, market response, and identification of shortcomings or improvements needed.

## Marketing and Promotion

Completed action 5: Launch marketing campaigns with a focus on sustainability and environmental benefits, increase promotion through local media and online platforms, and conduct market surveys to identify new opportunities.

## Impact in the Next 1 Year:

Claim the climate-friendly cow farm status, attracting more investment from the green sectors and Market the food additive product with real proof from the emission reduction and other benefits for the cows

JAN 2024

## Processing and Community Education

Completed action 2: Design and implement a training program for local communities on processing Belimbing Wuluh leaves into feed additives.

MAR 2024

JUN 2024

## Funding and Production Expansion

Completed action 4: Submit a funding proposal to support plant development, and once funding is approved, expand feed additive production to meet growing market demand.

AUG 2024

OCT 2024

## Implementation of IoT-Based Methane Gas Monitoring System on Farms

Completed action 6: Design a system that has been calibrated according to ISO/IEC 17025 standards. Socialize the benefits of the system to farmers, and collect monitoring data to evaluate the overall success of the program.

DEC 2024

2025



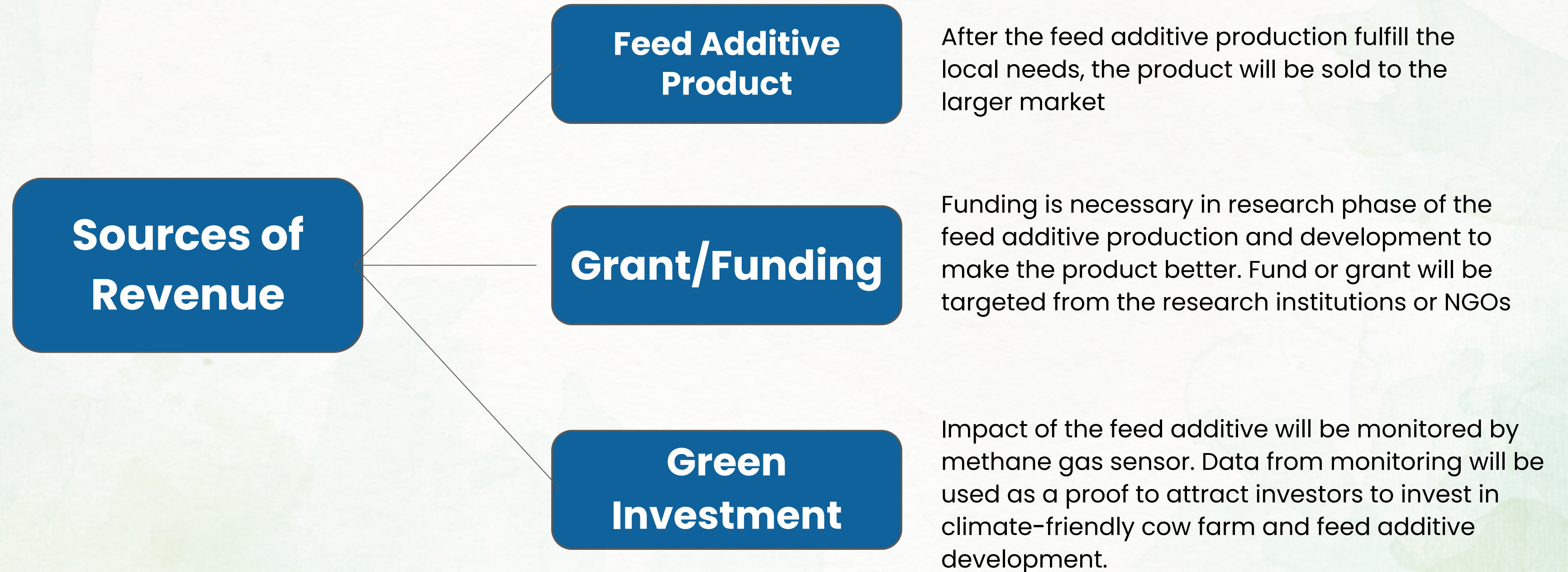


17 PARTNERSHIPS FOR THE GOALS



We intend to establish a partnership with Pentahelix Synergy in the farming sector. This concept involves various parties, including the government, academics, business entities or entrepreneurs, people or communities, and the media, who come together, coordinate, and commit to developing the potential of local Feed Additive Alternatives.

## Business Model



## META-Wuluh Team



### Salman Albir Rijal

Role: Head of Business and Development  
Education: Urban and Regional Planning  
Experiences: Representative of Indonesia at ASEAN-Japan Youth Forum '23 by Japan Foundation



### Hilman Zaydan Saputra

Role: Founder & CEO  
Education: Nutrition Science and Feed Technology  
Experiences: European Union Project Grantee, Most Outstanding Student Faculty of Animal Science



### Ravydo Anggara Jufri

Role: Head of Production  
Education: Instrument Meteorology Climatology and geophysics  
Experiences: 3rd International essay competition environment Korea