

Unlocking Renewable Energy for Rice Farming Communities and Reducing Rice Straw Emissions in the Philippines

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Project Overview and Relevance



Rice Straw Biogas Facility in the Philippines (Straw Innovations)

Develop a community-scale rice straw bioenergy system

Project Overview and Relevance



Rice straw after harvest



Burn rice straw

Shift from unsustainable straw disposal to improved agricultural practices and renewable energy production

Project Overview and Relevance

- Develop community co-designed business models
- Enabling positive sustainable trade-offs from rice straw biogas



Rice Straw Biogas Facility in the Philippines (Straw Innovations)

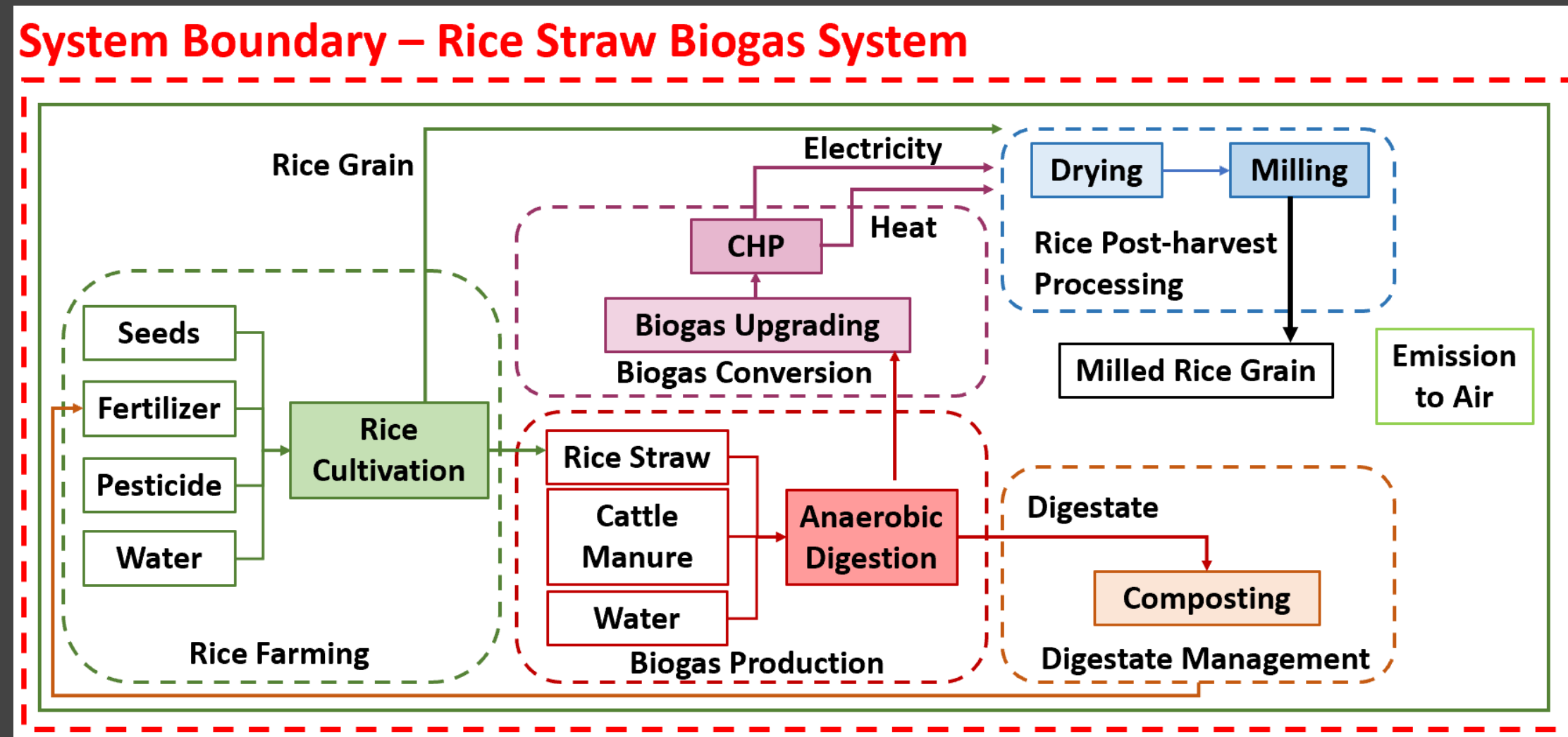
Aspects

Environmental

Socio-economic



Approach



- Evaluate the operational potential
- Identify emission performance

Contribution to the Project

- Evaluated the environmental aspects
 - Field emissions during rice cultivation
 - Fugitive methane emissions during biogas production
 - Lifecycle assessment of system

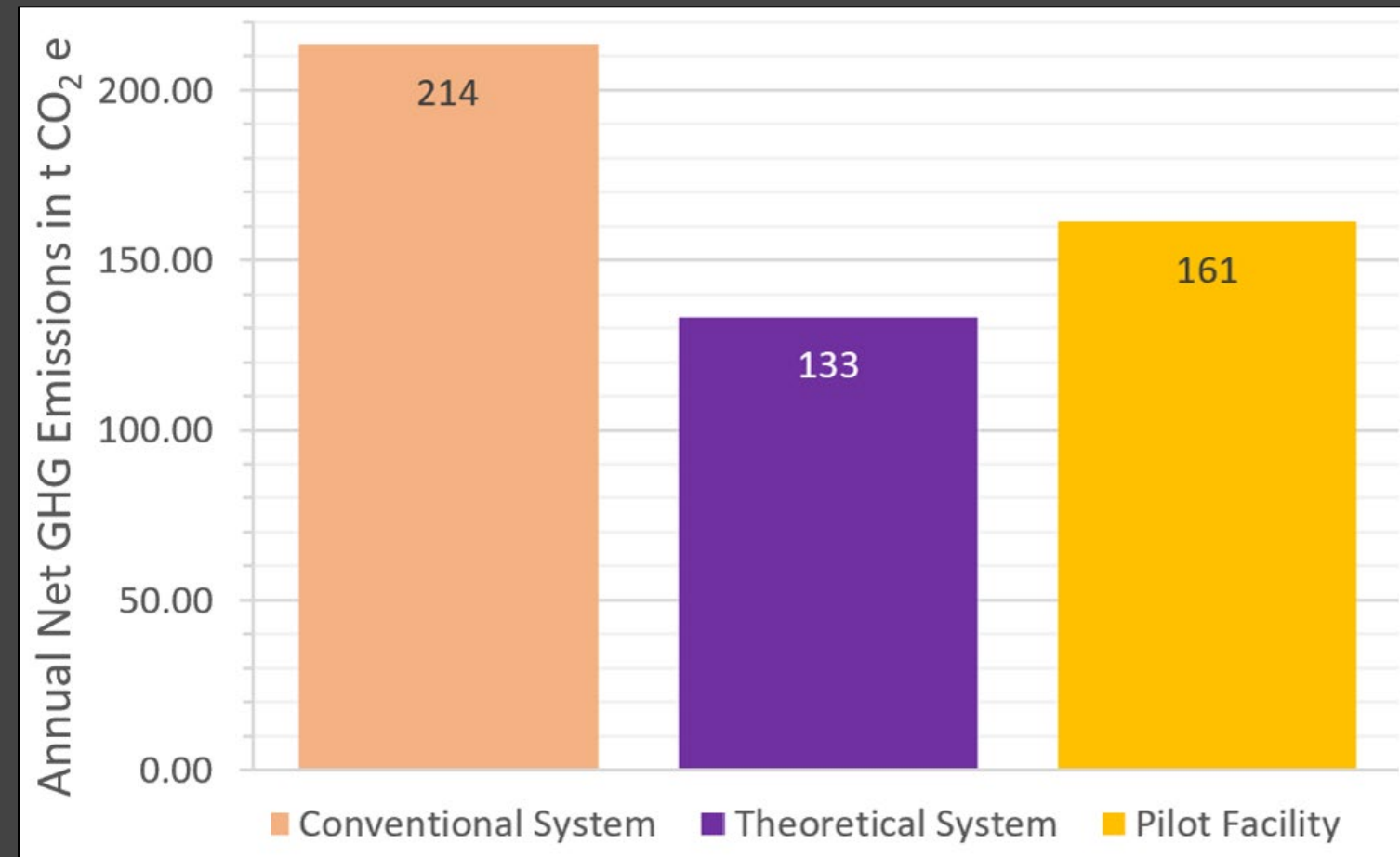


Results and Accomplishments

Output	Annual Biogas Production	
	Theoretical System	Pilot Facility
Biogas, kNm ³	16	3
Solid Digestate, t	114	96
Liquid Digestate, t	108	108
Energy Generated		
Electricity, MWh	11	2
Heat, MWh	47	8
Losses, MWh	14	2

⇒ Rice straw is a viable feedstock for biogas production

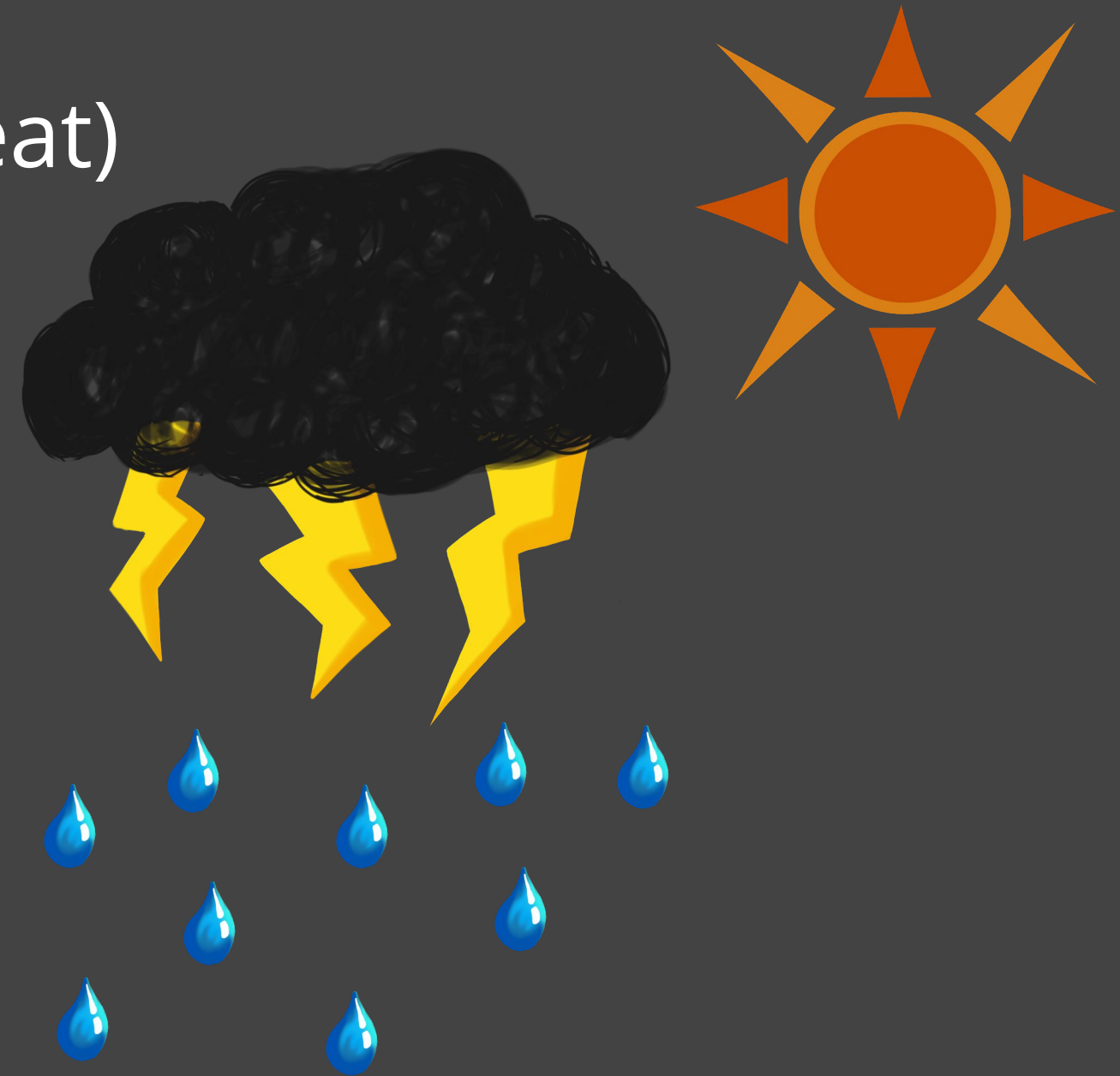
Results and Accomplishments



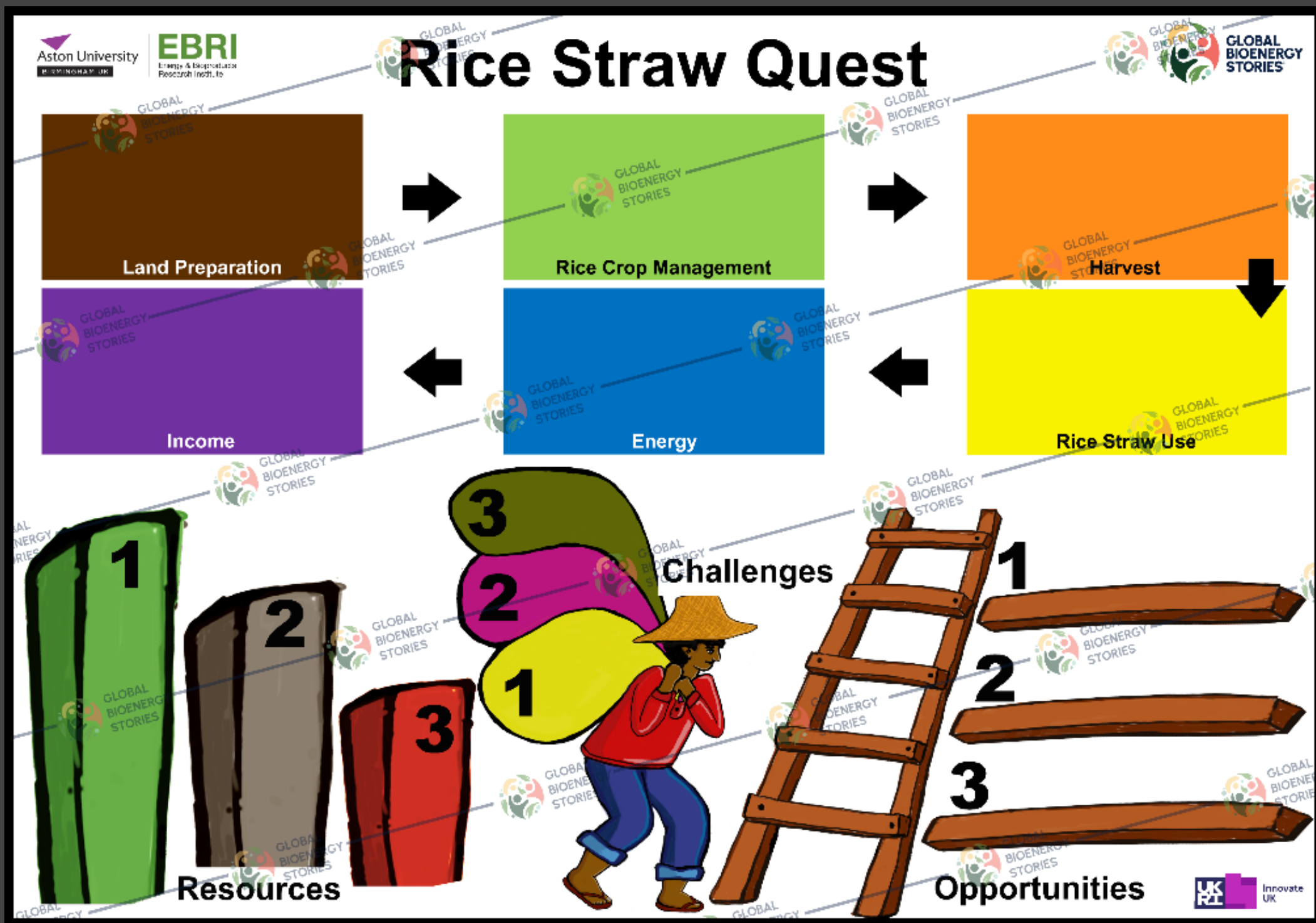
⇒ Rice farming emissions reduced by 24% to 38% when biogas is used for drying and milling

Challenges

- Climate Change (Typhoon, Extreme Heat)
- Air Pollution from Burning
- Methane Emission from Soil Incorporation
- Cost of Rice Production
- Availability of Agricultural Inputs
- Lack of Proven Business Models
- Technical Challenges



Approach



Contribution to the Project

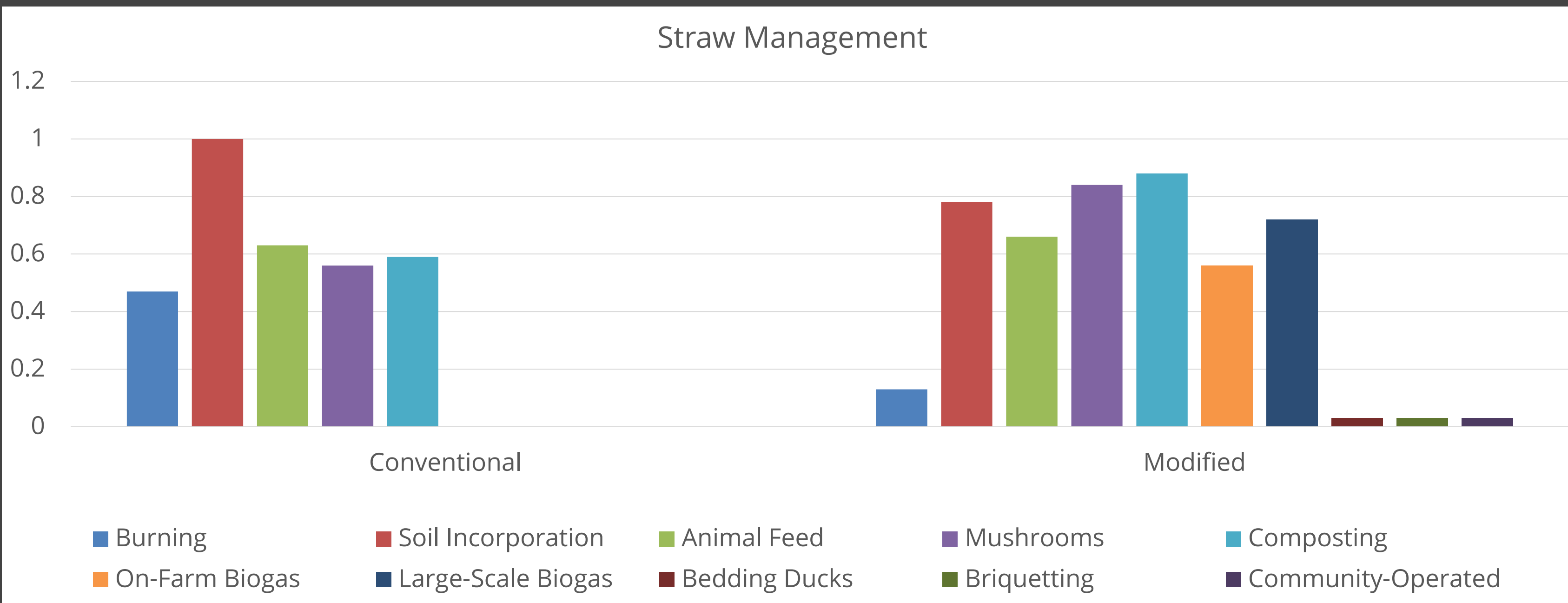
- Evaluating the social and socio-economic impacts
 - Farmer and stakeholder perceptions
 - Trade-offs and benefits
 - Non-monetized social advantages
- Assessing implications for commercialising the hub with local farming communities
- Map Sustainable Development Goals (SDGs) and bioeconomy benefits



Biogas from Rice Straw

Farmers' preferences in the Philippines

Straw Management



Biogas from Rice Straw

Farmers' preferences in the Philippines



Next steps and Bring Home Messages

Key Messages:

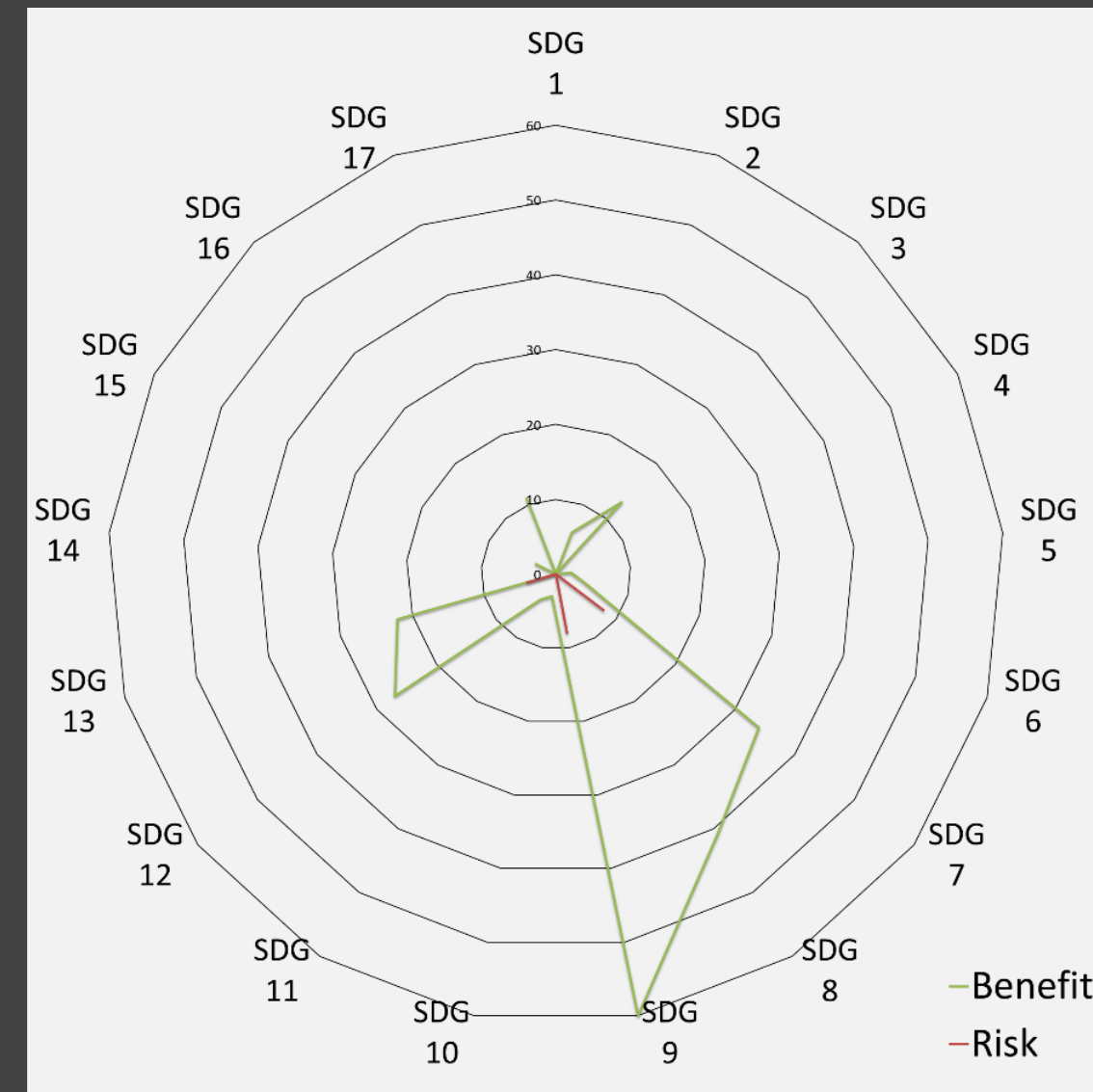
- Current rice straw management practices cause big environmental and health issues
- Demonstration and international industry-academic partnership allowed to show that rice straw is a viable feedstock for bioenergy
- Farmers don't want to be energy users only. Farmers want to be part of and benefit from the intervention.



Next steps and Bring Home Messages

Key Message:

- Rice straw biogas can deliver against 9 SDGs creating a wide number of opportunities and benefits



Result from Supergen Bioeconomy Indicator Model (BSIM)

Acknowledgements

- Innovate UK
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QUESTIONS

