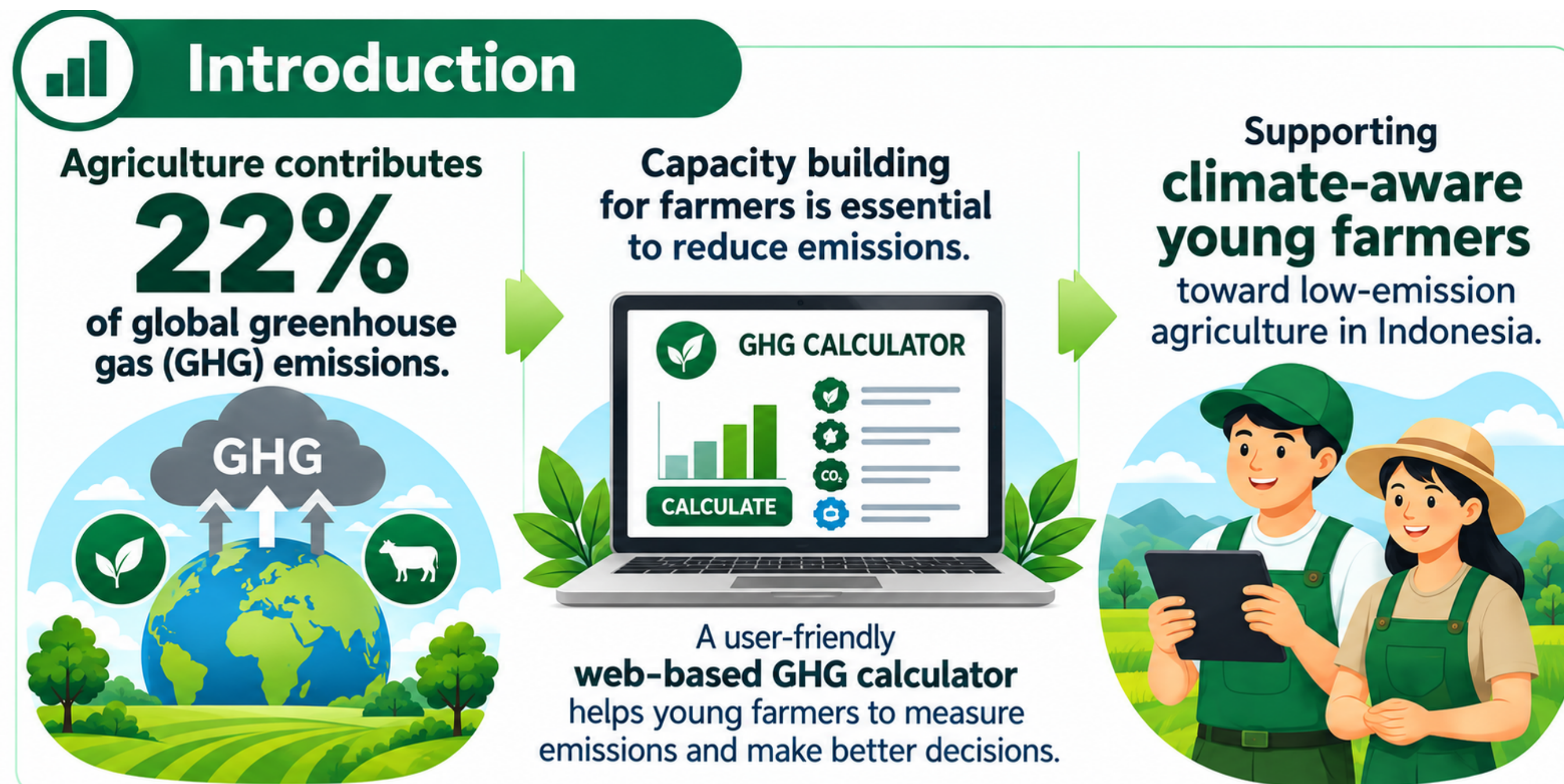
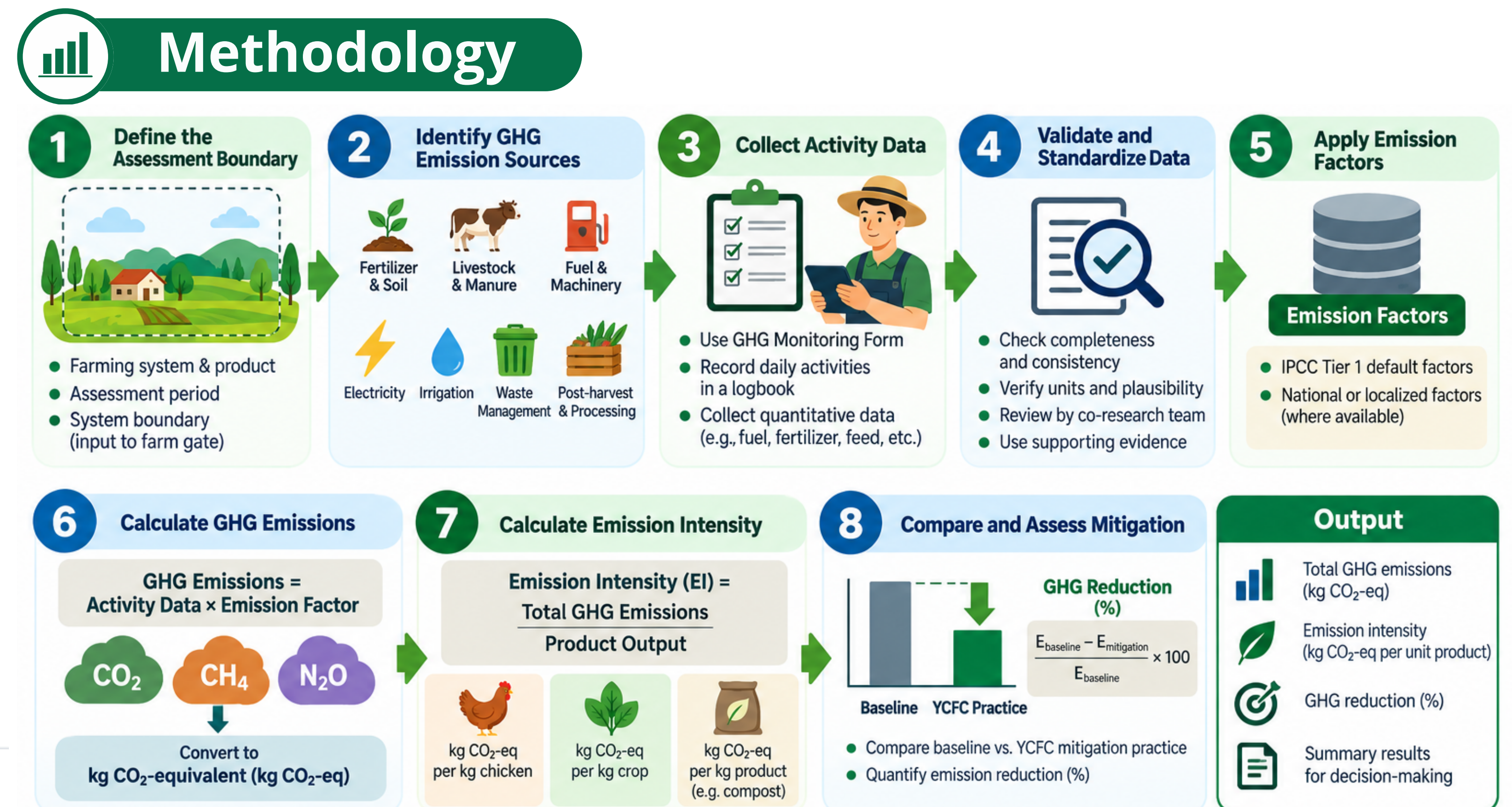


A Web-Based Greenhouse Gas Calculator to Empower Climate-Aware Young Farmers Toward Low-Emission Agriculture in Indonesia

Indra Permana¹, Joni Jupesta², Oktaviar Rahmat³, Astari Widya Dharma⁴, Diyah Sri Utami¹, Silke Stöber⁴¹Universitas Padjadjaran,
Fac. of Agriculture, Indonesia²IPB University, Centre for Transdisciplinary
and Sustainability Science, Indonesia³Kanal Kreasi Indonesia,
Tangerang, Banten, Indonesia⁴Humboldt-Universität zu Berlin,
Centre for Rural Development (SLE), Germany

RYCAM GHG - Calculator

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Result and Discussion

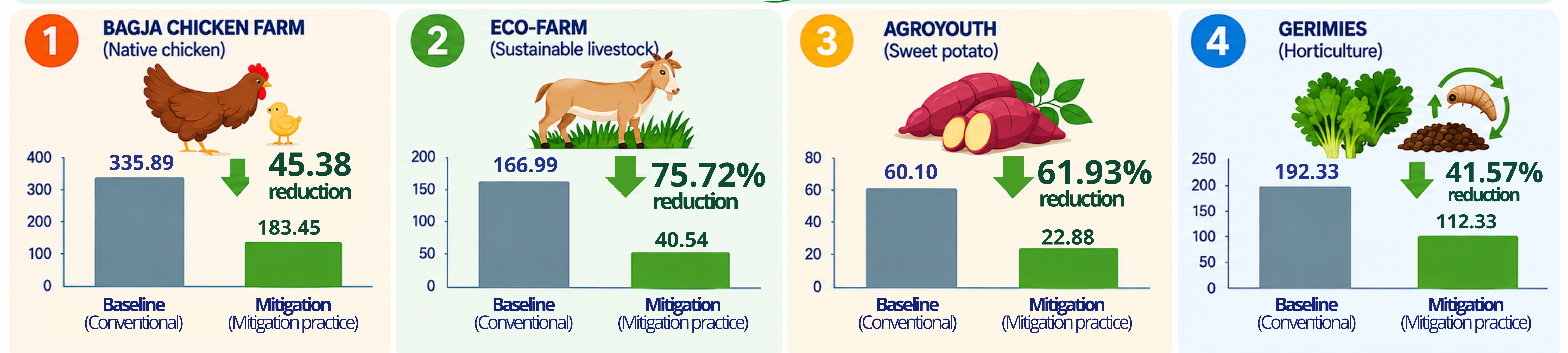
YCFC practices can reduce GHG emissions across diverse farming systems

Unit: kg CO₂-eq

3.1 Overview of GHG Emissions

Total Emissions per group (baseline vs mitigation)

Three of four groups achieved substantial emissions reduction, with Eco-Farm showing the highest reduction (75.72%)



3.2 Emission Sources (Identification of hotspots - Baseline)

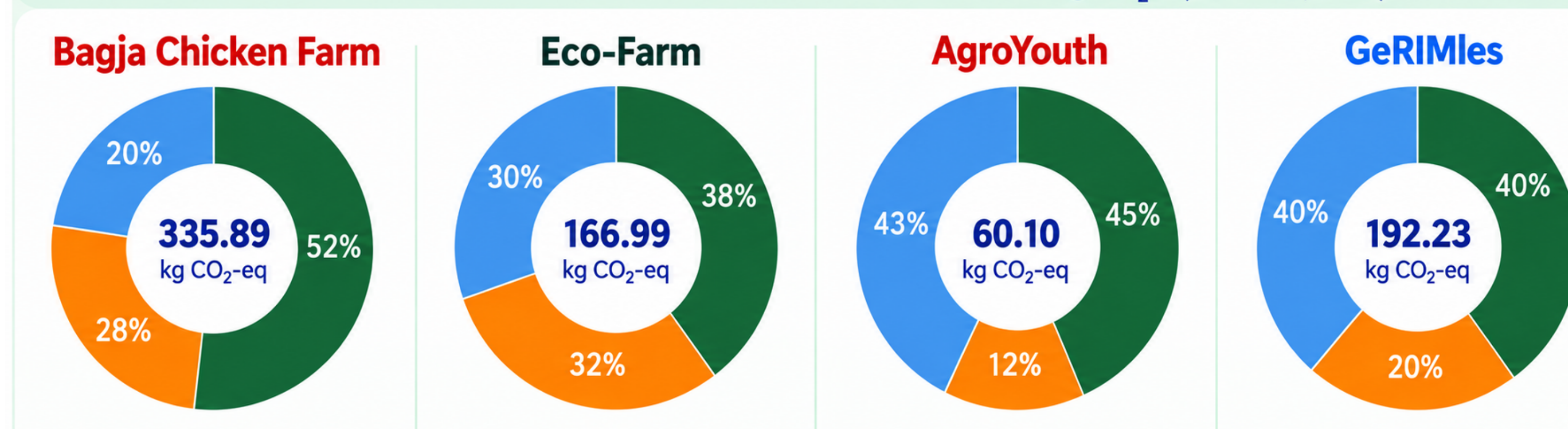
1 BAGJA CHICKEN FARM (Native chicken)			2 ECO-FARM (Sustainable livestock)			3 AGROYOUTH (Sweet potato)			4 GERIMIES (Horticulture)		
Emission source	Emissions (kg CO ₂ -eq)	Share (%)	Emission source	Emissions (kg CO ₂ -eq)	Share (%)	Emission source	Emissions (kg CO ₂ -eq)	Share (%)	Emission source	Emissions (kg CO ₂ -eq)	Share (%)
 Electricity – incubator	253.205	75.38	 Gasoline consumption (machinery/transport)	107.878	64.60	 Urea (synthetic fertilizer)	35.019	58.27	 Urea (synthetic fertilizer)	94.865	49.35
 Electricity – incandescent lamp	51.674	15.38	 Urea (synthetic fertilizer)	54.465	32.62	 Ammonium sulphate (fertilizer)	17.741	29.52	 Lime (soil amendment)	77.458	40.30
 Gasoline consumption (transportation)	30.991	9.23	 SP-36 (phosphate fertilizer)	2.184	1.31	 Diesel consumption (machinery/transport)	6.304	10.49	 Diesel consumption (irrigation/transport)	6.042	3.14
 Manure management	0.019	0.01	 KCl (potassium fertilizer)	2.074	1.24	 KCl (potassium fertilizer)	1.037	1.73	 SP-36 (phosphate fertilizer)	5.616	2.92
			 Livestock emissions (enteric fermentation & manure)	0.386	0.23	 Other (planting materials, tools, packaging)	0.000	0.00	 Other (planting materials, buildings, equipment)	2.337	1.21
Total	335.890	100.00	Total	166.987	100.00	Total	60.101	100.00	Total	192.232	100.00



3.3 Emission Type

Share of total emissions per group

- CO₂ (fossil fuel, electricity)
- CH₄ (livestock, organic waste)
- N₂O (fertilizer, soils)



3.4 Emission Intensity per Product

GHG emissions per unit of product (mitigation stage)

Unit: kg CO₂-eq / unit

Bagja Chicken Farm	Eco-Farm	AgroYouth	GerIMles
DOC	Silase	Sweet potato	Fresh vegetables
1.94	0.045	0.059	0.405
kg CO ₂ -eq / bird	kg CO ₂ -eq / kg	kg CO ₂ -eq / kg	kg CO ₂ -eq / kg
Native chicken	Compost		BSF maggot
3.21	0.033		1.728
kg CO ₂ -eq / kg	kg CO ₂ -eq / kg		kg CO ₂ -eq / kg
	POC		
	0.267		
	kg CO ₂ -eq / L		

Conclusion

- The web-based GHG calculator effectively supported young farmers in measuring emissions, identifying hotspots, and evaluating mitigation options
- YCFC practices significantly reduced GHG emissions across diverse farming systems, with the highest reduction in Eco-Farm (75.72%), followed by AgroYouth (61.93%), Bagja Chicken Farm (45.38%) and GerIMles (41.57%)
- The tool promotes evidence-based decision making and strengthens the capacity of young farmers toward low emission and climate-resilient agriculture

Future Research

- Scale up the GHG calculator across more young farmer groups and diverse agro-ecological contexts.
- Integrate economic and social assessments to evaluate co-benefits and feasibility.
- Enhance the calculator with location-specific emission factors, offline access, and multilingual support.
- Explore integration with digital advisory services, carbon credit schemes, and policy support to enable wider adoption.