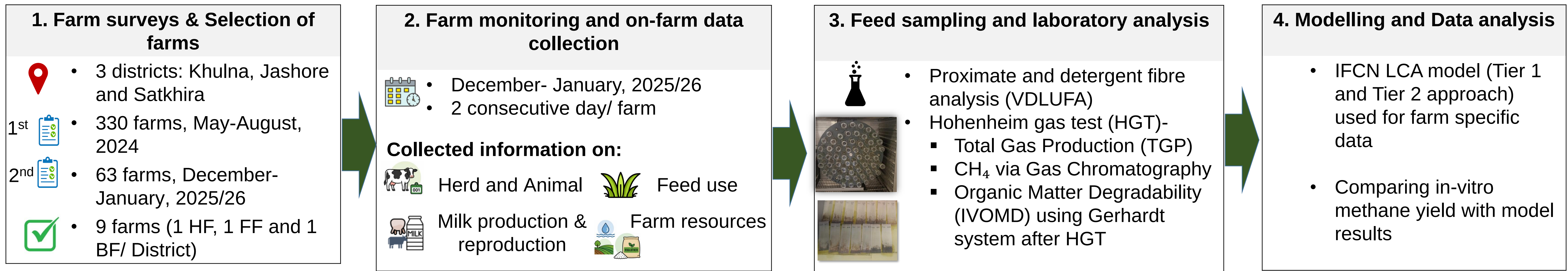


Aim

-  To quantify and compare enteric CH₄ emissions using baseline measurement (HGT: Hohenheim gas test) and model estimate (IFCN LCA model: International Farm Comparison Network Life Cycle Assessment), and evaluate the model's validity as a decision-support tool.

Illustration of work process



Farm types	*No. of dairy cows	Purpose of rearing	Labour
Household Farm (HF)	1-3	Family consumption; sell surplus milk	Family members
Family Farm (FF)	4-16	Sell milk and make profit	Family members
Business Farm (BF)	>16	Business-based/Return on Investment	Hired labour

IFCN partial LCA model		
1. Inventory inputs	2. Core boundary calculation	3. Standardized output allocation
Data collection from global and on-farm sources (Cradle-to-farm-gate)	Processing within the cradle-to-farm-gate perimeter	
• Herd and animal management • Crop and feed production • Resource use and management	• Direct emissions- enteric and manure CH₄ • Indirect emissions- farm management related	Kg-CO ₂ -eq. / kg SCM or ECM
	Calculations aligned with IDF LCA standards and IPCC guidelines	

IDF: International Dairy Federation, SCM: Solid corrected milk, ECM: Energy corrected milk

Results

Study region	Farm types	Herd size	Number of dairy cows	Average body weight (Kg/cow)	Average milk production (L/cow/day)	Milk Fat (%)
Jashore	HF	8	2	400	7.8	4.3
	FF	8	4	421	9.9	4.5
	BF	58	29	450	10.9	4.5
Khulna	HF	3	2	380	7.0	4.1
	FF	8	4	420	8.5	4.2
	BF	25	18	470	9.8	4.7
Satkhira	HF	4	2	370	7.9	4.8
	FF	12	8	430	10.1	3.8
	BF	38	26	300	11.2	4.8

Range across 9 farms			
Intake and diet composition		Methane yield- g CH ₄ /cow/day	
DMI(kg/cow)	8.6- 13.6	Baseline (HGT)	187- 293
CP (g/kg DM)	85.6-157.8	IFCN Tier 1	264 - 322
aNDF (g/kg DM)	374- 608	IFCN Tier 2	254 -362

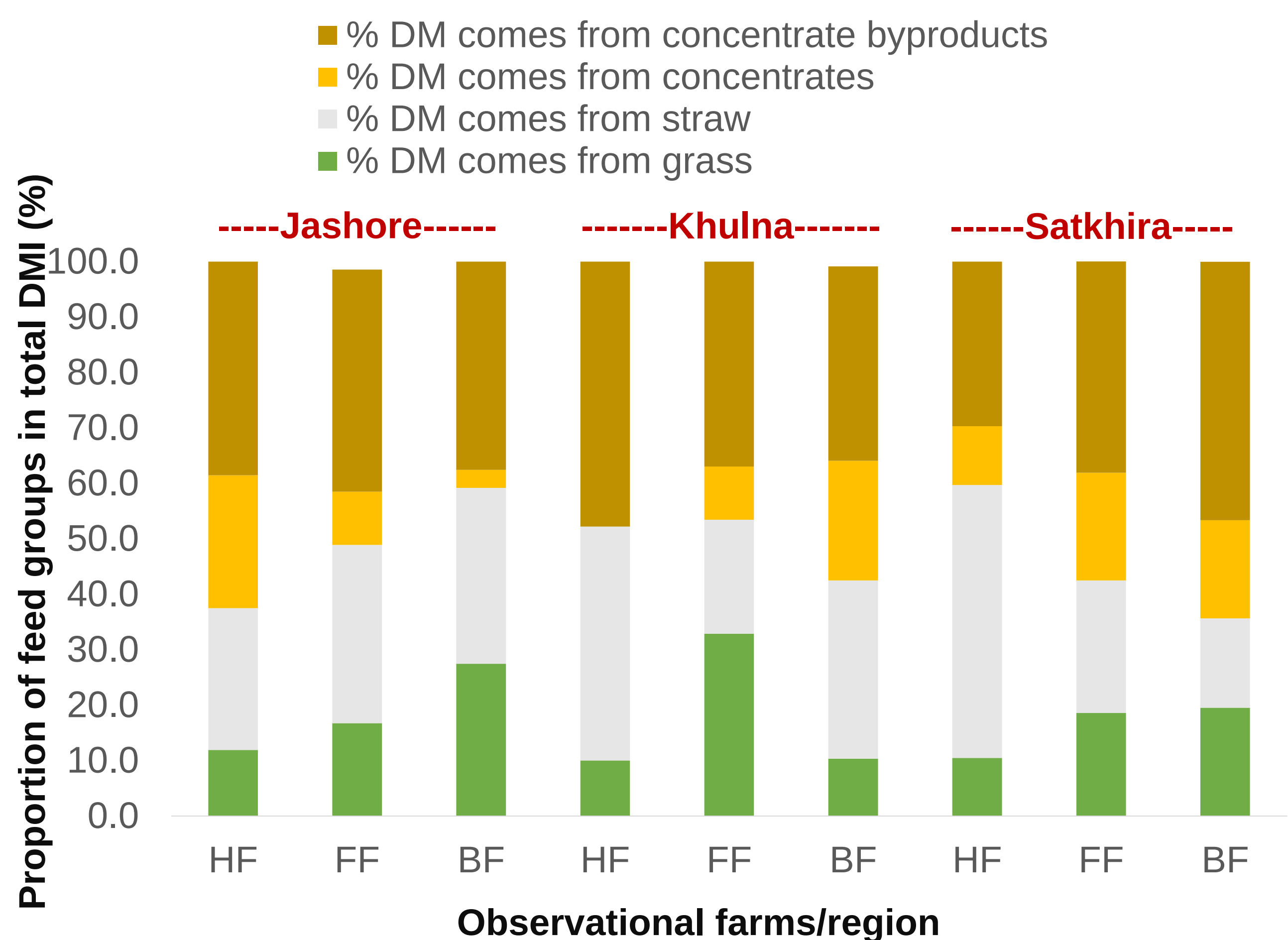


Figure 2: Share of feed groups in total DMI

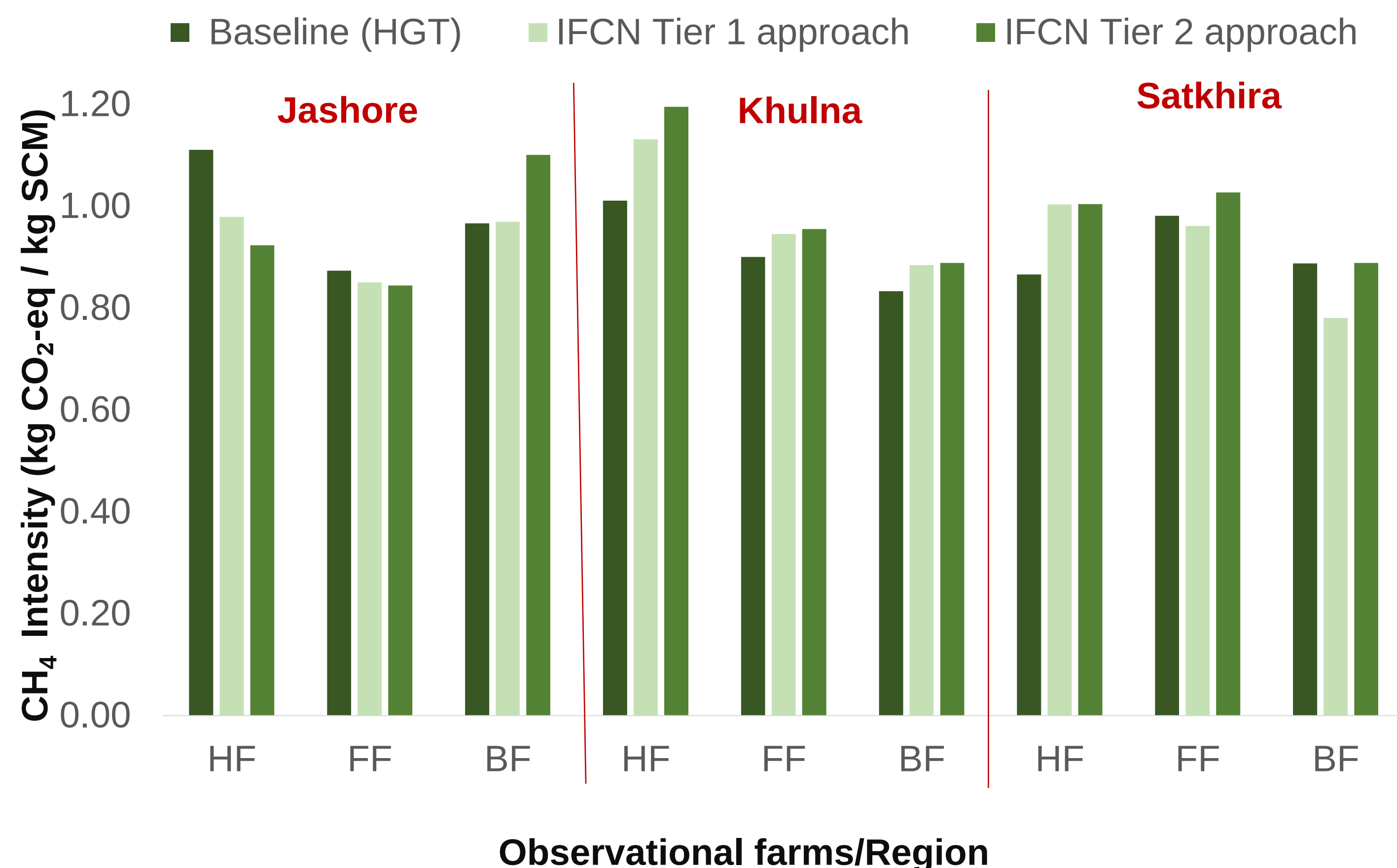


Figure 1 : Methane Intensity Profiles: *in-vitro* Baseline vs IFCN Tier Models (kg CO₂-eq / kg SCM)

Metric	Baseline (HGT)	IFCN Tier 1	IFCN Tier 2
Intensity range (kg CO ₂ -eq/kg SCM)	0.83–1.11	0.78–1.13	0.84–1.20
Mean deviation vs HGT	—	–1.2%	–5.0%
Per-farm deviation range	—	–15.9% to +12.1%	–18.2% to +16.9%
Max absolute error	—	~16%	~18%

Key messages

- National level methane estimation.** IFCN LCA models can be useful tool for regional/national, data-driven CH₄ estimation with limited laboratory facility.

Acknowledgement



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