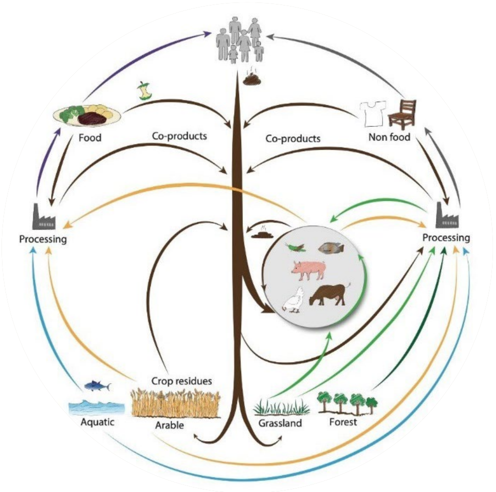
Sustainable animal production around the globe

With case material from dairy production in East Africa

March 13, 2024, Jan van der Lee and Augustine Ayantunde, NWGN-NFP event



WAGENINGEN
UNIVERSITY & RESEARCH

Objective

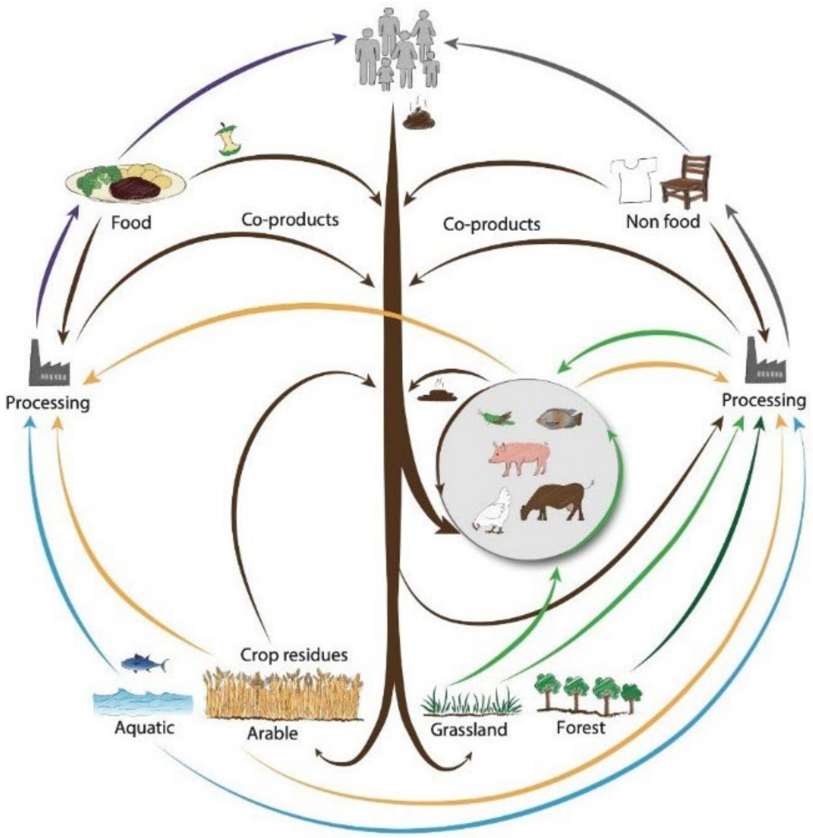
Explore trade-offs and synergies between various sustainability objectives of ASF production and consumption

- with a food system lens, focus on production
- global, with case material from dairy in East Africa.

Further reading:

- Oosting SJ, van der Lee J, Verdegem M, de Vries, M, Vernooij A, Bonilla-Cedrez C, and Kabir K (2021). Farmed animal production in tropical circular food systems. Food Security 14: 273-292.
- Oosting, 2022. The multifunctional role of cattle in East African food systems: The perspective for climate smart dairy development. Presentation NEADAP CoP27 event “The contribution of dairy to resilient food systems in East Africa”
- Oosting et al., 2024. The multifunctional role of livestock in East African food systems, in “African food security 2050”, Routledge.
- van der Lee, J., Alvarez Aranguiz, A., Pishgar Komleh, H., & Ndambi, A. (2022). Dairy Sustainability Assessment Tool: User Manual. Wageningen Livestock Research, Wageningen University & Research

The role of animals in the food system

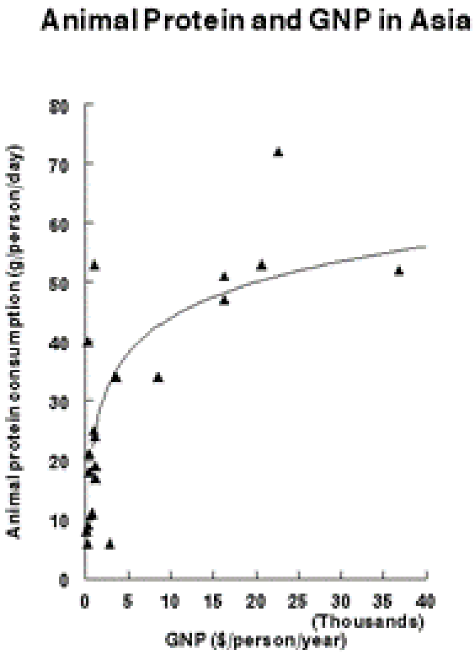


WAGENINGEN
UNIVERSITY & RESEARCH

Trade-offs of reduced (increased) ASF production

Less livestock means (a.o.) …

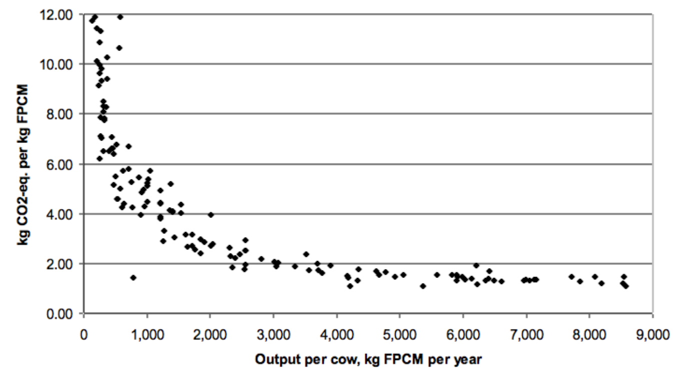
- **Less high-quality protein and micro-nutrients** available for infants and breastfeeding (unless productivity increases)
- **Less low-grade biomass converted in food** – natural grasses, crop- and food waste (e.g., oil seed cake, fruit pulp)
- **Less organic manure** > lower crop yields or more fossil fertilizer
- **Less animal traction** > more mechanization with fossil fuels
- **Less stability** – “piggy banks” – less stable livelihoods



Narrow or broad sustainability concept? (

NARROW

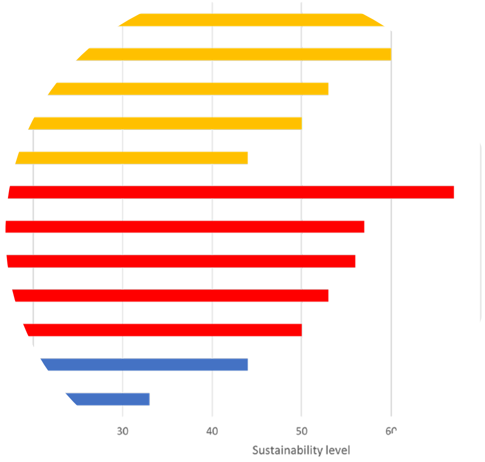
Focus on GHG emissions > efficiency focus > higher yield/unit to meet cons. demand



- Implicit choice for productivity, food security and climate change objectives
- Alienation of Southern partners

BROAD

IGA - Situation-specific pathway develop-ment through joint assessment and planning of lkey sustainability objectives/ interventions (people-profit-planet, DSAT)



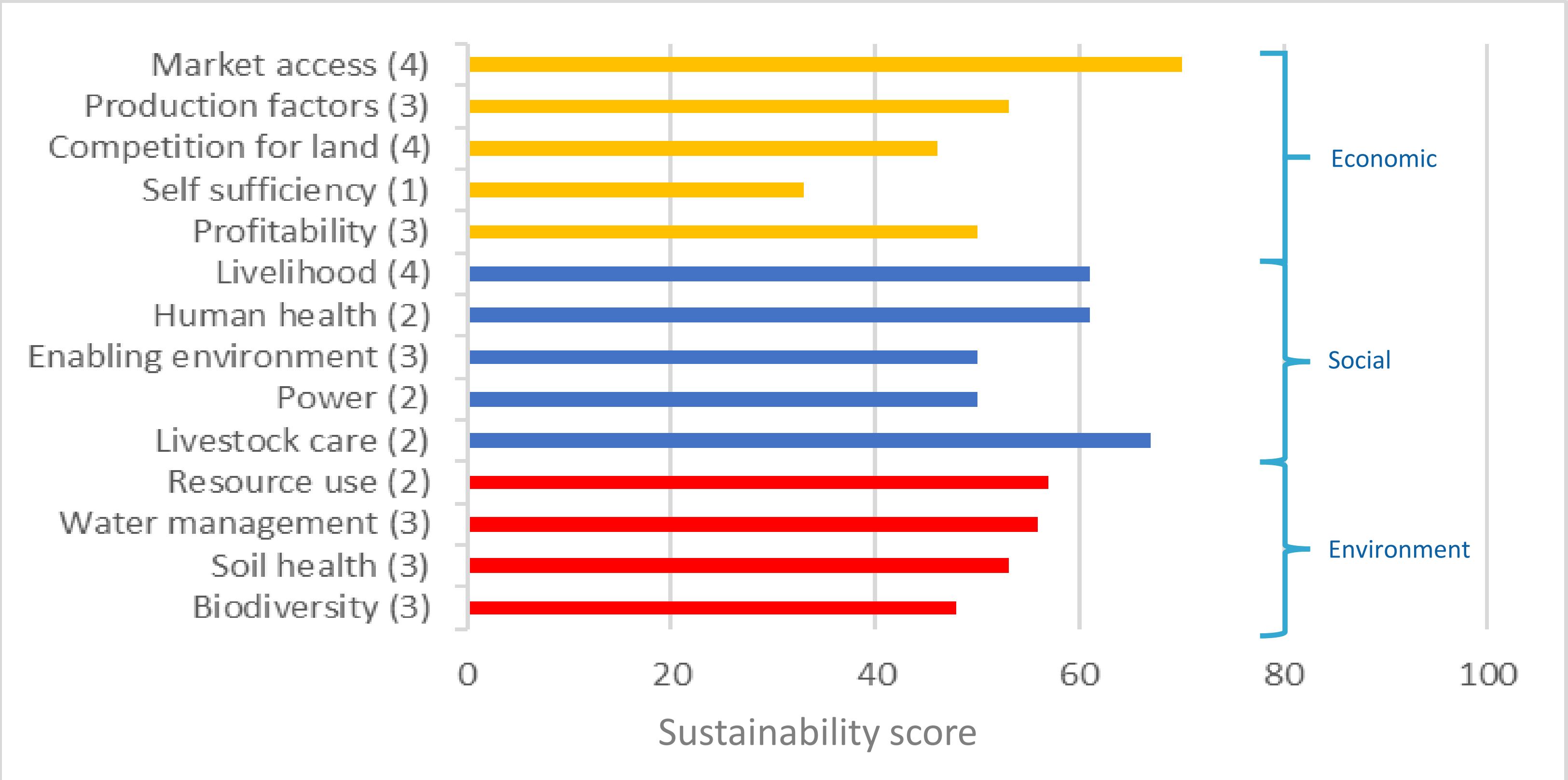
Sustainability objectives (of a food system)

Domain	Objectives	Indicators
Climate Smart Agriculture	• Food and nutrition security • Feed-food competition • Climate change mitigation • Climate change adaptation	• Quantity, quality • Land use • Productivity • Carbon sequestration • Resilience (diversity and modularity)
Biodiversity	• Biodiversity • Natural resource management	• Nature, water, land • Quantity • Quality (pollution and degradation)
Socio-economic	• Livelihood & income • Employment & economic development • Social equity & liveability	• Economy • Independence • Power (inclusivity) • Rural liveability

Perception of sustainability aspects by dairy actors

Netherlands East Africa Dairy Partnership

Results from NEADAP **DSAT**-workshops in Kenya, Uganda, Tanzania and Rwanda; *no of times 14 aspects are selected; Scores for selected aspects: 0 = perceived as not sustainable ....100 = perceived as sustainable)*



What livestock farming systems to focus on?

2019 figures	Ethiopia	Kenya
Human population (million)		
Total	99	50
• mixed crop-livestock smallh.	35	20
• (agro-)pastoralists	12	9
• (semi-)specialized farmers	<0.02	<0.02
Cattle population (million)		
Total	70	22
• Dairy	13	5

- ➢ Mixed crop-livestock and (agro-)pastoralist systems essential for 40-60% of population
- ➢ Few (semi-)specialized farms, generally with extreme land-scarcity (- feed production) => limited growth potential
- ➢ Minority of cattle are for dairy, others for other objectives

Key animal farming systems – performance on sustainability objectives

System Sustainability objectives	(agro-) pastoral	mixed crop-livestock	specialized
Food & nutrition	+	++	+++
Feed-food competition	+++	++	-
Climate change adaptation	+ to +++	++	- to +
Climate change mitigation	+	+	++
Biodiversity & natural resources	+++	+	-
Income & livelihood	+	+++	+
Employment and economic development	0	++	+++
Social equity and liveability	?	++	- to +

WAGENINGEN
UNIVERSITY & RESEARCH

Promising interventions – diverse objectives

- Connect smallholders to markets, diversity crops and ASF, facilitating input & service delivery and output marketing, *e.g., facilitate forage & forage seed markets to use forage as cash crop, breed dual purpose crop varieties (food and feed)*
- Subsidize trade in organic manure rather than in fossil fertilizers
- Land use planning – land utilization and zoning, agroforestry
- Circularity – use of food waste as feed (drying pulp, upgrading crop residues), use of novel proteins (insect meal, yeast, algae as animal feed)
- Food safety – assure quality of ASF – health and consumer trust
- Think about fish / aquaculture

NEA DAP
Netherlands East Africa Dairy Partnership

Thanks for your attention

jan.vanderlee@wur.nl

WAGENINGEN
UNIVERSITY & RESEARCH