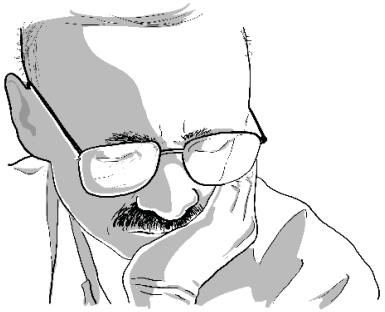
CENTRE FOR SCIENCE AND ENVIRONMENT

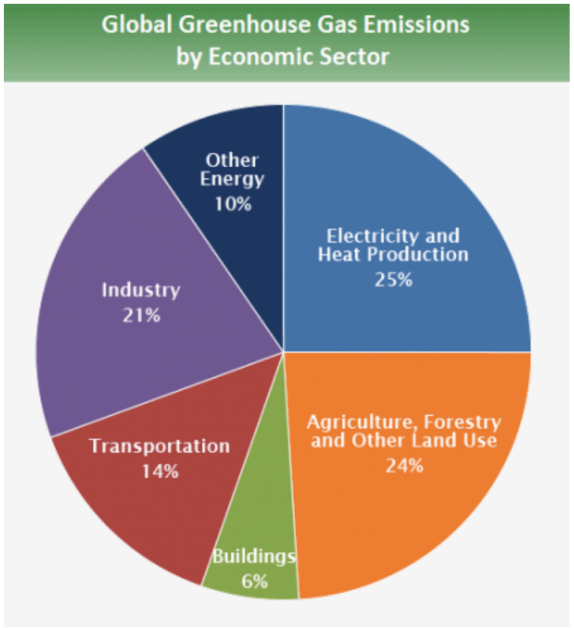


ANIL AGARWAL DIALOGUE 2020

ANNUAL MEDIA CONCLAVE ON THE STATE OF INDIA'S ENVIRONMENT

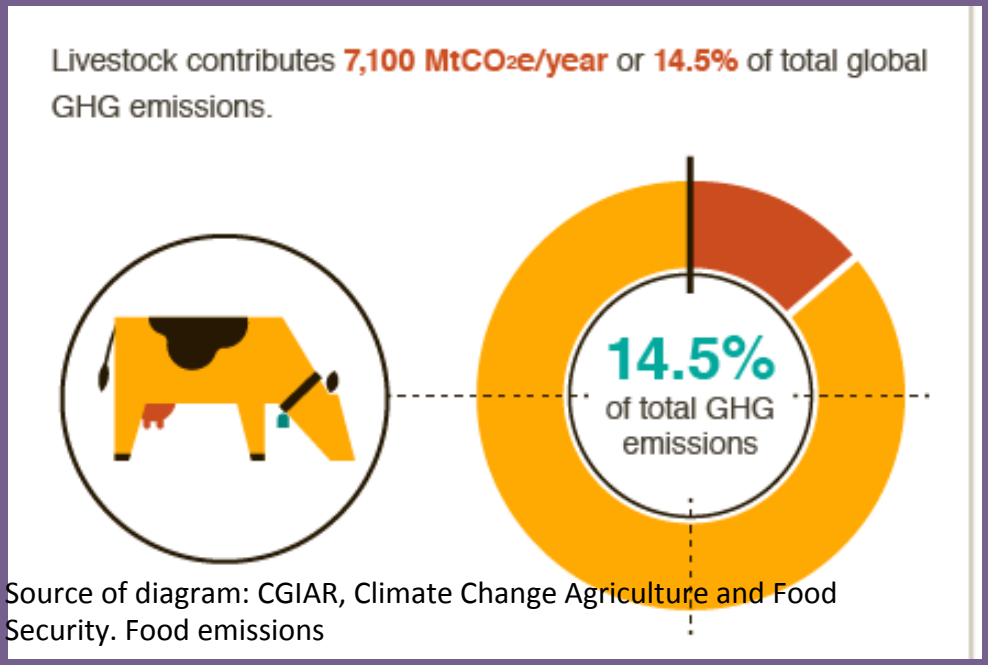
Livestock Farming, Food and Climate Change: Is small still beautiful ?

Dr Sagari R Ramdas, Food Sovereignty Alliance, India



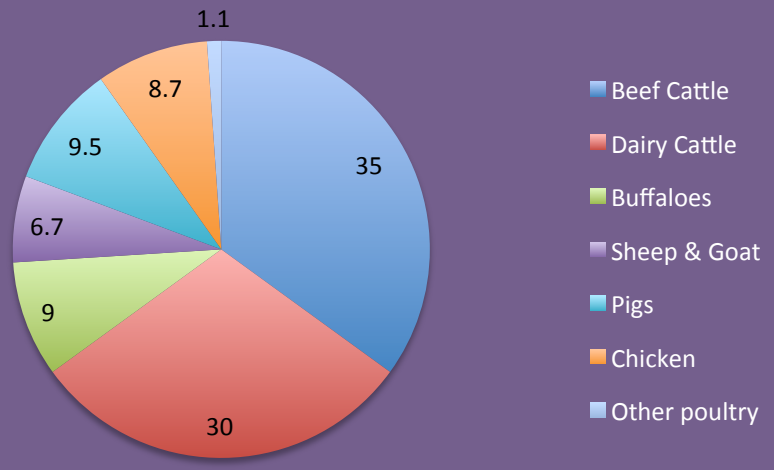
Source: IPCC (2014); EXIT based on global emissions from 2010. Details about the sources included in these estimates can be found in the *Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. EXIT

Global anthropogenic GHG Emissions : Livestock



Source of diagram: CGIAR, Climate Change Agriculture and Food Security. Food emissions

Species contribution (%)



Source: Gerber,2013. FAO

How to mitigate GHG emissions within a context of apparent growing demand for animal protein particularly in the global south ?

Global Production: Meat & Milk

Table 3: Global production of meat and milk from large ruminants (beef and dairy cattle), small ruminants (sheep and goats), pigs and poultry by production system, and by TLU: Tropical Livestock Unit

		Total	Grass-based livestock systems	Mixed crop-livestock systems	Other	Landless livestock systems
Large ruminants	Animal number (million TLU, % of total)	956.7	174.6 (18%)	542.1 (57%)	181 (19%)	59 (6%)
	Milk (Mt/yr, % of total)	570	33 (6%)	397 (70%)	95 (17%)	45 (8%)
	Meat (Mt/yr, % of total)	68	9 (13%)	44 (64%)	11 (16%)	5 (7%)
Small ruminants	Animal number (milllion TLU, % of total)	181.2	59.2 (33%)	94.6 (52%)	19.1 (11%)	8.4 (5%)
	Milk (Mt/yr, % of total)	21	4 (22%)	12 (58%)	3 (13%)	1 (7%)
	Meat (Mt/yr, % of total)	13	4 (29%)	7 (56%)	1 (10%)	1 (6%)
Pigs	Animal number (million TLU, % of total)	199.3	-	-	74.5 (37%)	124.8 (63%)
	Meat (Mt/yr, % of total)	91	-	-	22 (24%)	69 (76%)
Poultry	Animal number (million TLU, % of total)	159.5	-	-	69.5 (44%)	90 (56%)
	Eggs (Mt/yr, % of total)	149	-	-	14 (9%)	135 (91%)
	Meat (Mt/yr, % of total)	96	-	-	12 (13%)	84 (87%)

Data from Herrero et al. (2013). Livestock production systems as defined by Seré and Steinfeld (1996), first mapped by Thornton et al. (2002) and updated by Robinson et al. (2011).[27]

Source of Table: FCRN, 2017

Emissions intensity kg/litre of meat/milk is highest in 'low productivity' regions / extensive grazed systems

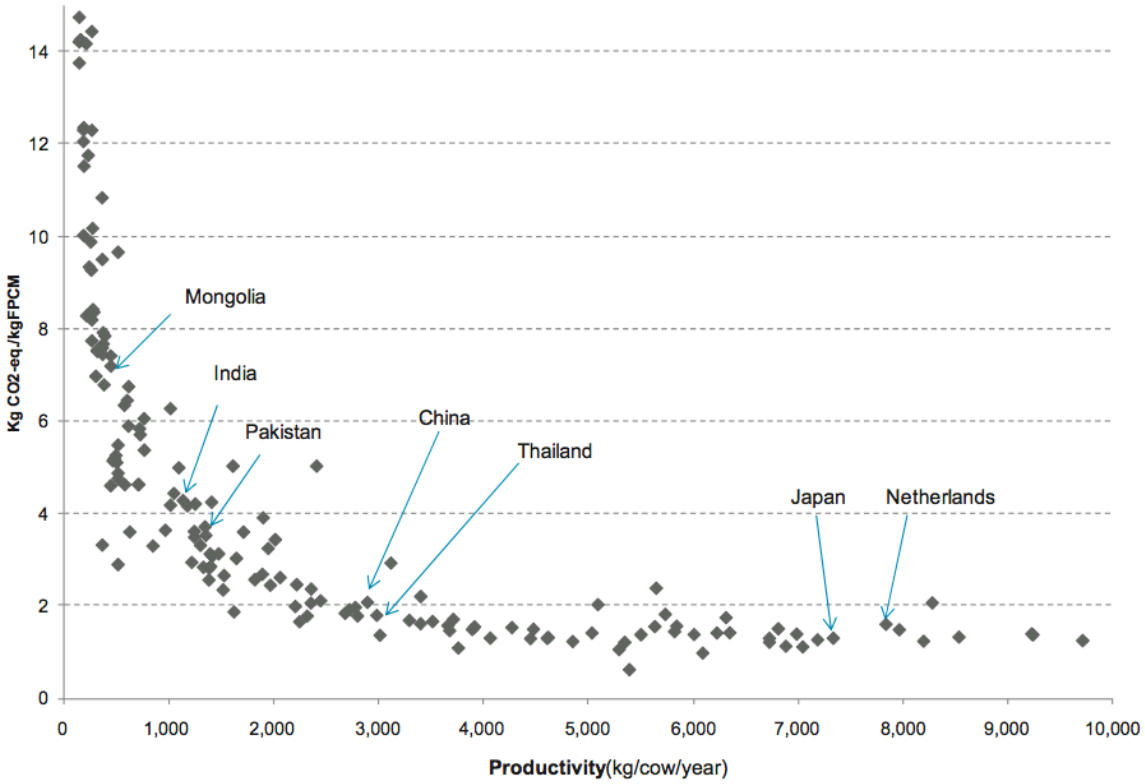


Figure 3. Relationship between milk yield and GHG emission intensity per unit of fat and protein-corrected milk

Source: FAO (2010).

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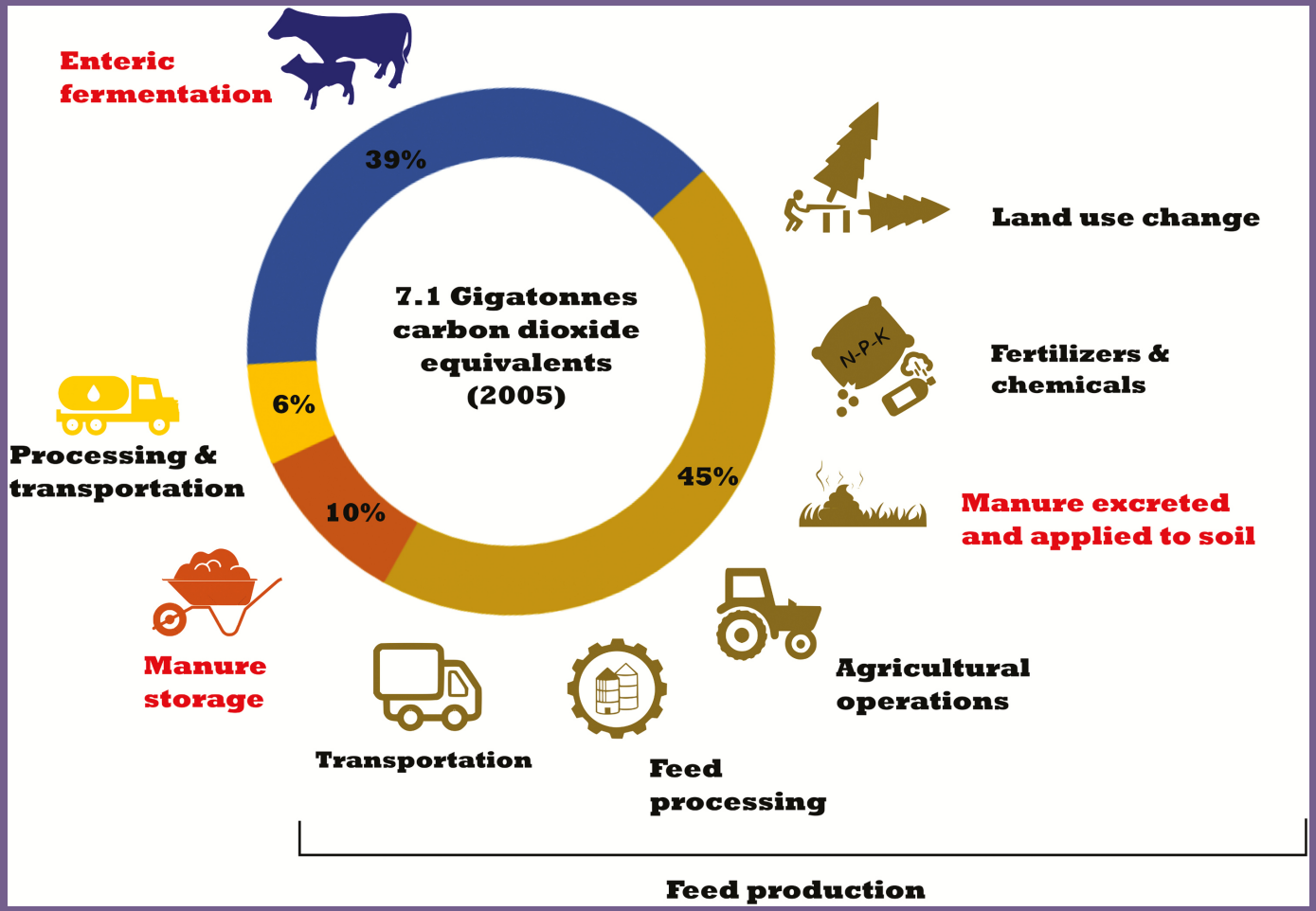
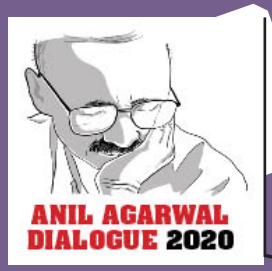
Sources of GHG emissions



Source of diagram: Grossi et al. 2019. Animal Frontiers. Vol 9, Issue 1 . Jan 2019.
Data is adapted from Gerber, 2013. FAO



Contours of the Global GHG emissions from livestock reduction debate

1) FAO and Industry: Huge potential for reduction in low productivity regions- South Asia, via intensification:

(i) change genetics: high yieding livestock breeds
(ii) herd structure: reduce non-productive animals
(iii) change feed: highter levels of concentrate feeds
(iv) reduced dependency on land via stall feeding or
(v) Leguminous fodder crops/ protein rich pastures

2) Switch to a VEGAN-Completely Plant based diet

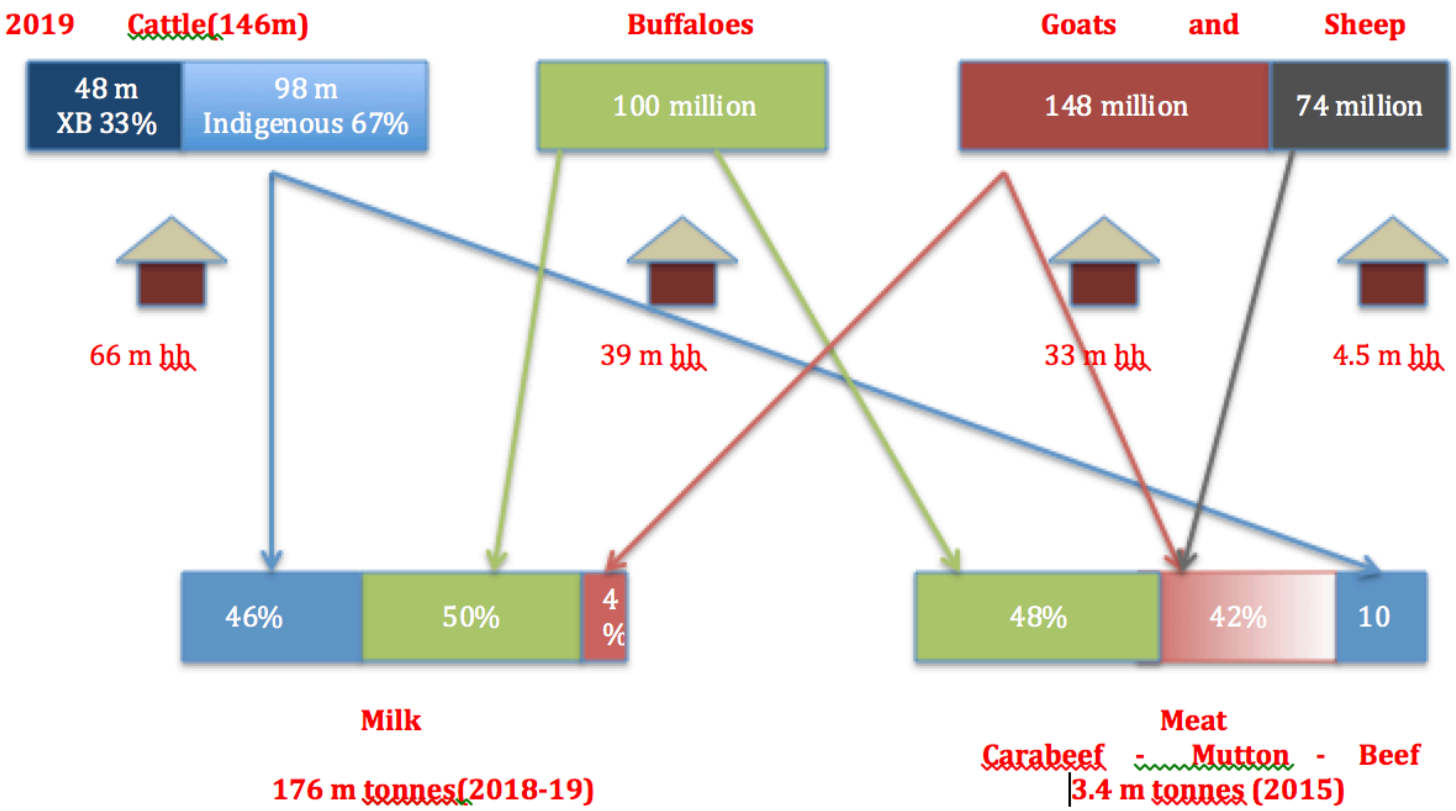
3) Huge hitherto unaccounted advantages of grazing-based production systems for Animal Protein:

a) Ranchers

b) Economically & Ecologically vulnerable communities- small&marginal farmers, pastoralists of the Global South: multifunctionality of their production systems: mixed crop-livestock

CSE

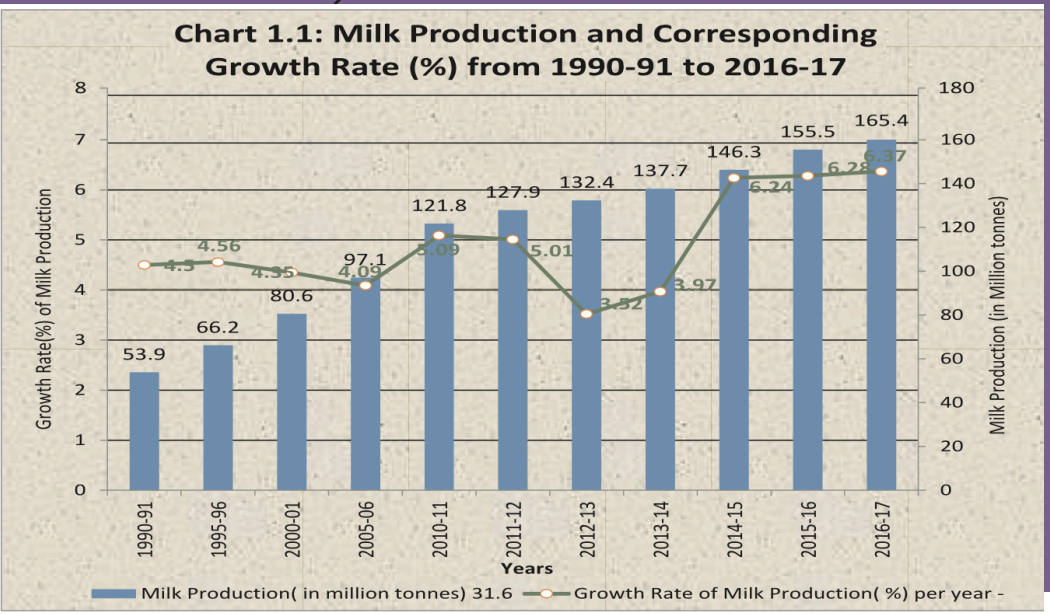
India: Milk and Meat from Ruminants



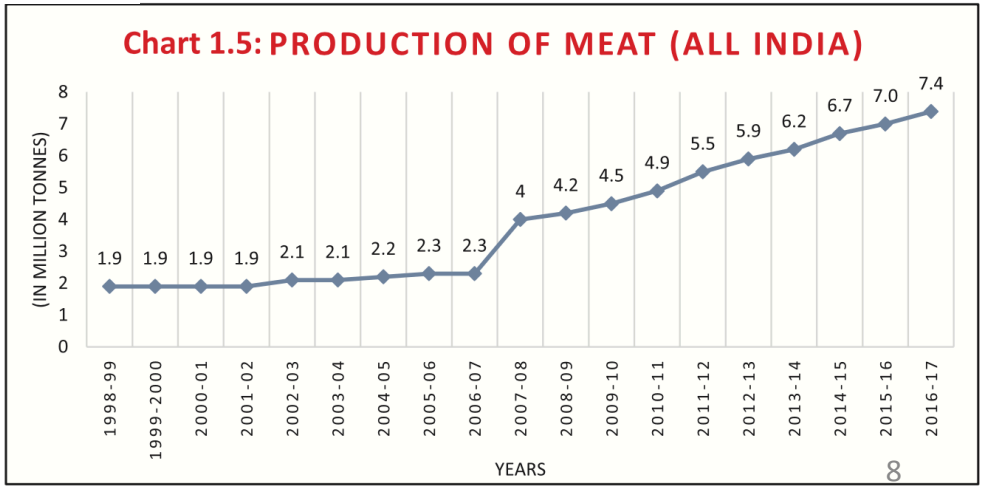
Milk: 48% consumed at home ; 52% Marketed

Marketed: over 50% marketed by 'unorganised' ; short of 50% by the organised (Economic Survey of India 2018-19). In the organised – 50:50 Private: Cooperative

The Indian Dairy and Meat Boom



Dairy: Value of INR 10527 billion in 2019



GHG emissions for Dairy: NDDB data :

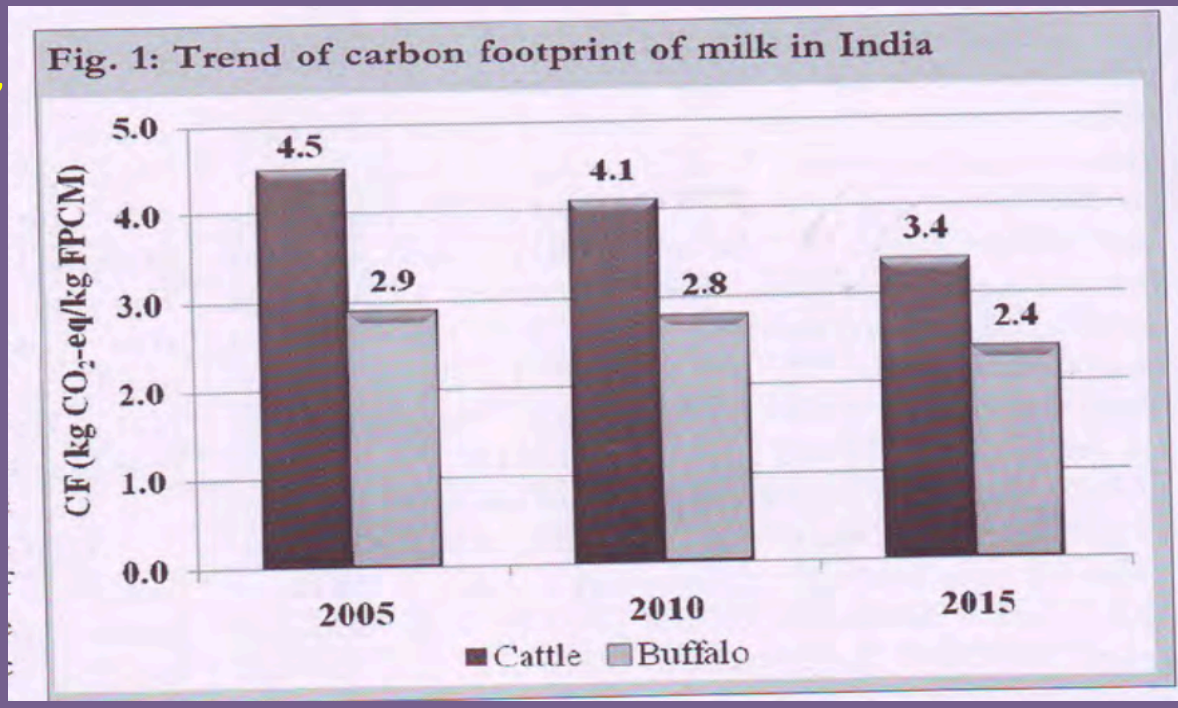
Table 1: GHG emissions (mt CO_2-eq/year) by the Indian dairy sector during 2005-15

Emission source	2005	2010	2015
Feed production (CO_2)	22.5	23.1	23.5
Feed production (CH_4)	30.7	32.3	28.9
Feed production (N_2O)	13.4	14.0	13.2
Total GHGs from feed production	66.6	69.4	65.6
Enteric fermentation (CH_4)	448.0	467.7	475.4
Manure management (CH_4)	34.5	37.1	37.4
Manure management (N_2O)	24.3	24.8	25.6
Managed soils (N_2O)	21.1	21.6	22.5
Fuel combustion (CH_4, N_2O)	23.9	24.0	25.6
Post-farm gate (CO_2, CH_4, N_2O, HFCs)	7.4	8.9	11.3
Gross total GHG emissions	626.0	653.7	663.7
Net total GHG emissions	372.1	421.5	449.8

Source: Garg et.al. 2018 Carbon Footprint of Milk in India: Past Trends and Future Prospects. Indian Dairyman

Reasons cited for Declining Carbon Footprint of Milk in India: Intensification

- Genetic upgrading of local cow through crossbreeding, and increased crossbred population
- Improved feeding via concentrates
- Increased production via higher genetics and feed regimes
- Future massive scope of enhancing genetically high producing females
- Biogas to manage manure



Source: Garg et.al. 2018 Carbon Footprint of Milk in India: Past Trends and Future Prospects. Indian Dairyman

Livestock census 2012-2019: + 41% in Exotic-XB Cows

What is the Ownership Base of this Production ?

- < 1990: 84% of indian milch animals on farms with 1-5 animals contributing nearly 90% of total milk production

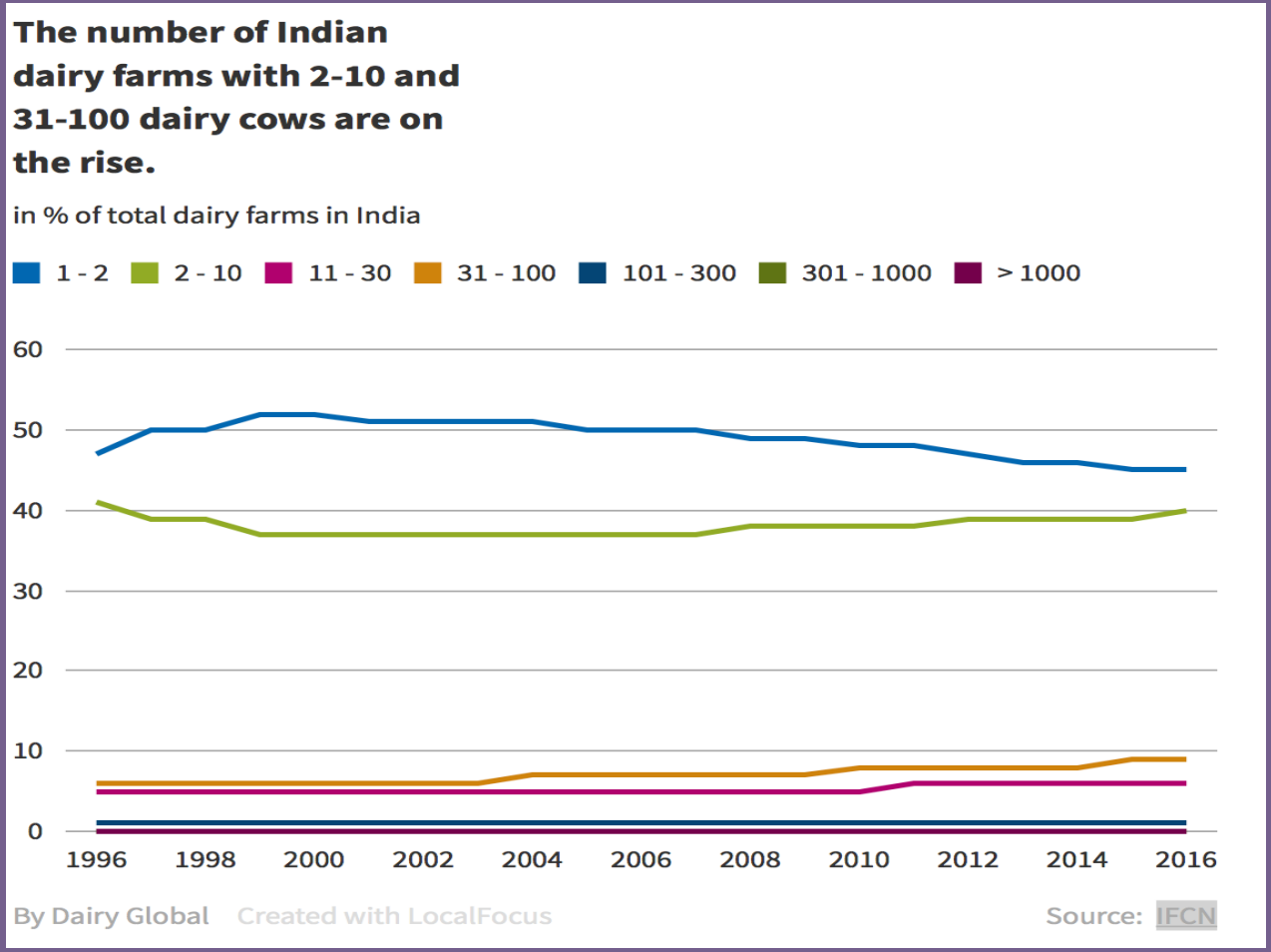
  2017: 79% of Indian milch animals on farms with 1-5 cows. (IFCN, 2017). 75% of Milch cattle with S&M farmers (85% of all farmers) DAHD 2018-19.

- Family farms with 10-50 cows is constantly growing; in some regions by up to 30% each year. (IFCN, 2017)

- gradual structural shift in milk production from small and marginal farmers to medium and large farmers is underway (USDA, Landes 2017; Yes Bank, 2015; Rabobank, 2016)

- Of 76 million farms involved in milk production in India, nearly 40% of total milk production occurs through medium and large farms (some large farms even have more than 1,000 animals), and only 60% of production continues to be contributed by small and marginal farmers (owning one to two animals). (Yes Bank, 2016)

- Amul, 5%–10% of farmer members are commercial large-scale dairy farmers, with projections of many more heading that way (Das 2015).



Structural Shift in Production Base from Small to Medium: Decline in the small farms with 1-2 dairy animals

Source: https://www.dairyglobal.net/Market-trends/Articles/2017/12/Dairy-farms-in-India-become-bigger-226874E/

Globally too we have evidence of how policy frameworks that facilitate intensification (industrial production) has driven production from small holders to larger farms: global North, pig rearers in China , poultry rearers in Thailand

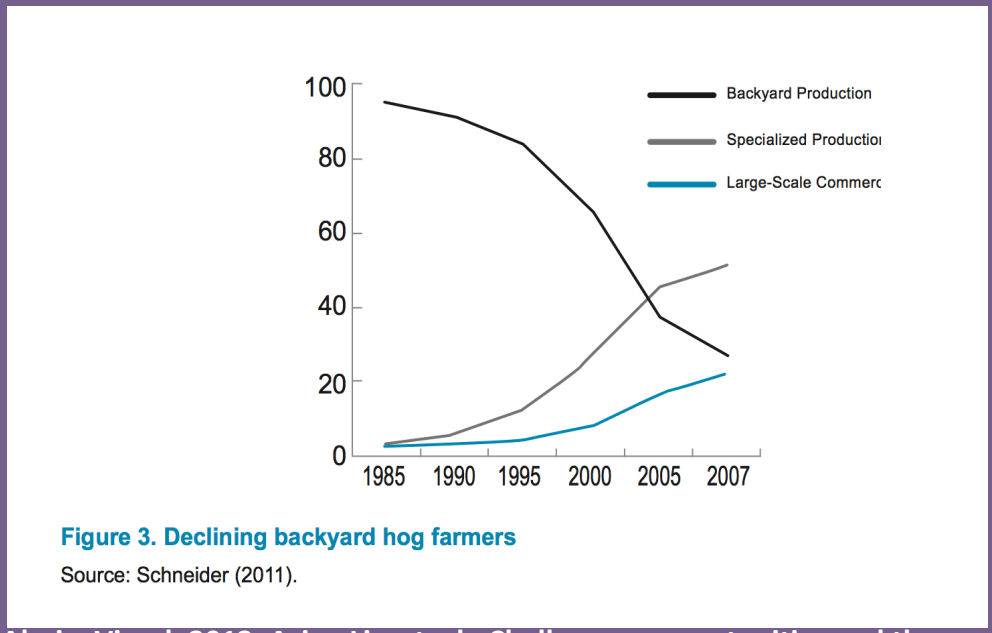


Figure 3. Declining backyard hog farmers

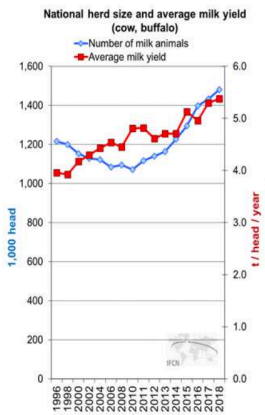
Source: Schneider (2011).

Source: Ahuja, Vinod. 2013. Asian Livestock: Challenges, opportunities and the response. Proceedings of an International Policy Forum held in Bangkok, Thailand,

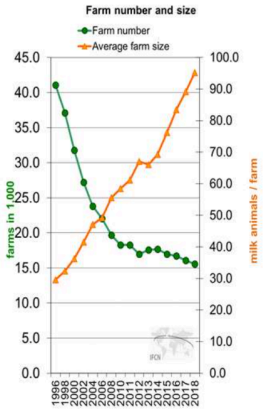
Ireland: Dairy dynamics and farm structural changes

IFCN
Dairy Data · Knowledge · Inspiration

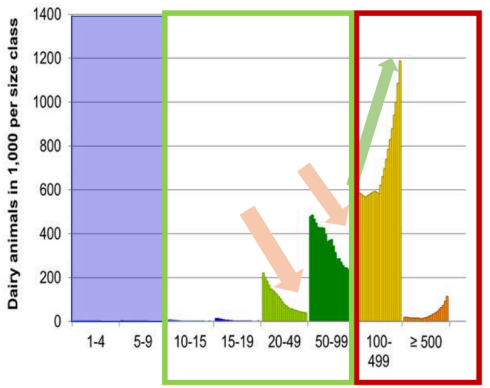
No. cows/ yield



No. farms & farm size



No. cows in farm size segments 1996 - 2018



Expansion of the Organised: Monopolies down the Value Chain: Procurement, Processing, Distribution, Mergers & Acquistions

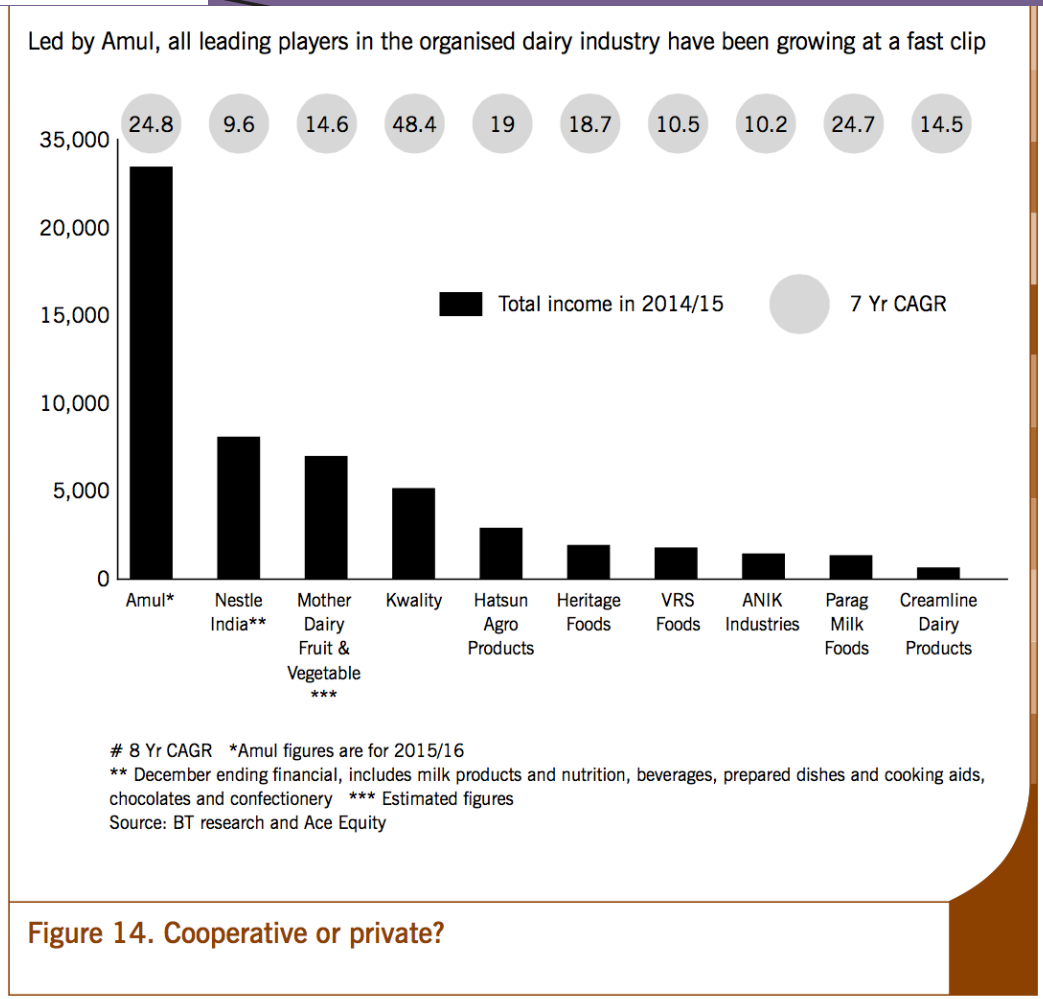


Figure 14. Cooperative or private?

Source: Shashidhar, A. (2016), "The Rs 80,000 crore milk business", Business Today, 5 June 2016, www.businesstoday.in/magazine/cover-story/indian-dairy-market-is-on-a-tear-due-to-new-players/story/232545.html.

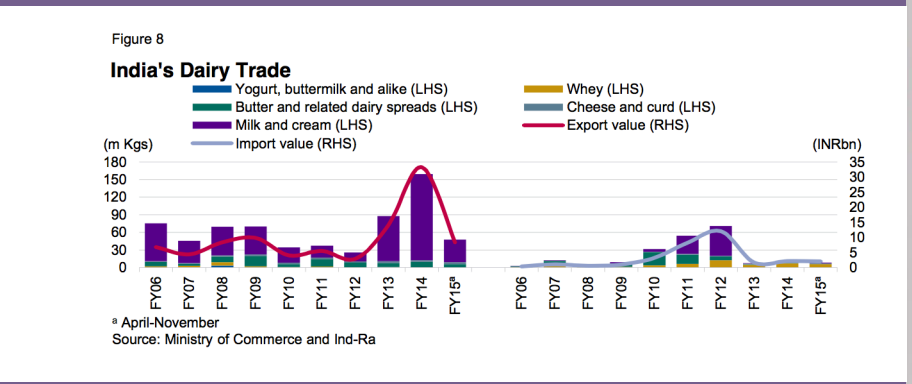
Informal: Formal/organised

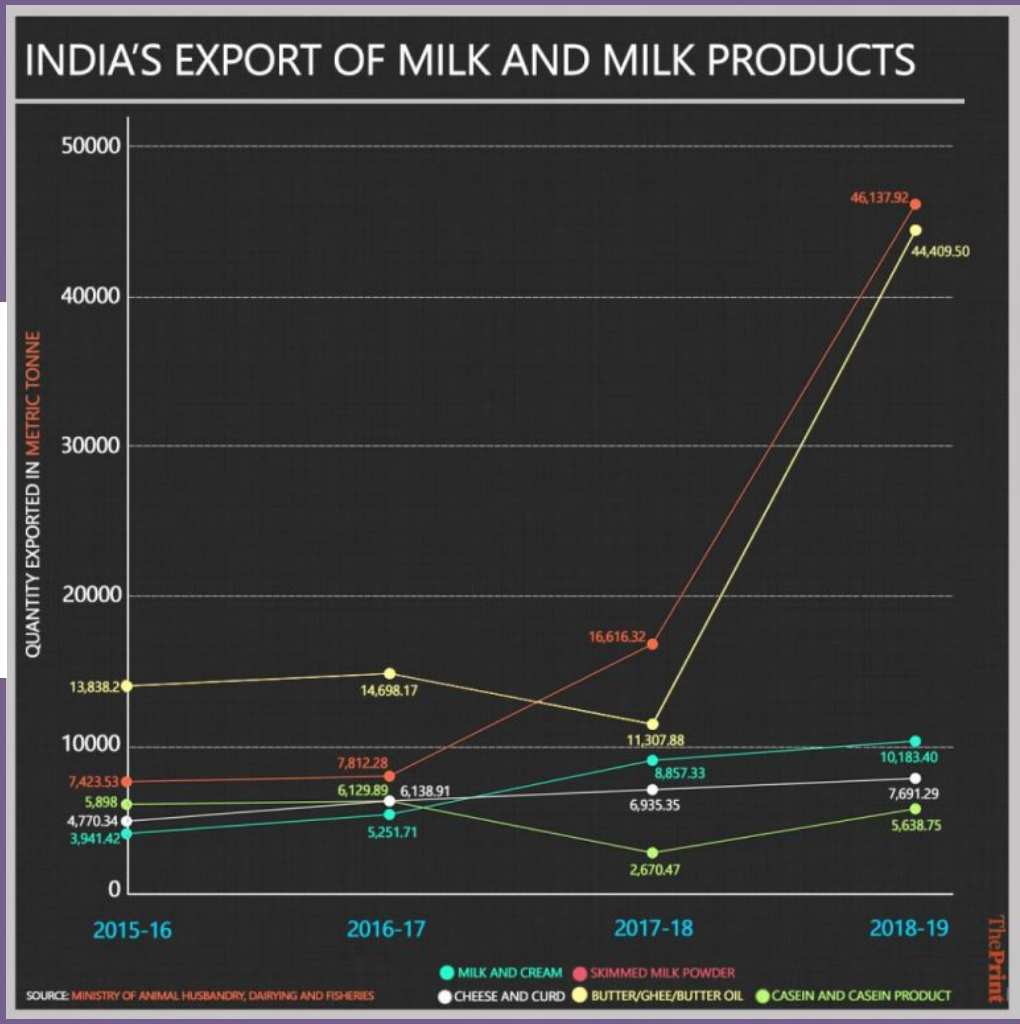
< 1990 75 : 25
2018: 50 : 50

Rate of annual growth of organised sector: 25-30 %

- **Le Lactalis (France) – acquired Tirumala , Anik, Prabhat**
- **Schreiber Dynamix- US Schreiber Food and Dynamix foods India**
- **Nestle India**
- **Danone (France) -exited in 2017. In 2019 jv with Epigamia**
- **Fonterra Future Dairy Fonterra (New Zealand) –Future Groups India (2018) -**

Global Integration: Exports

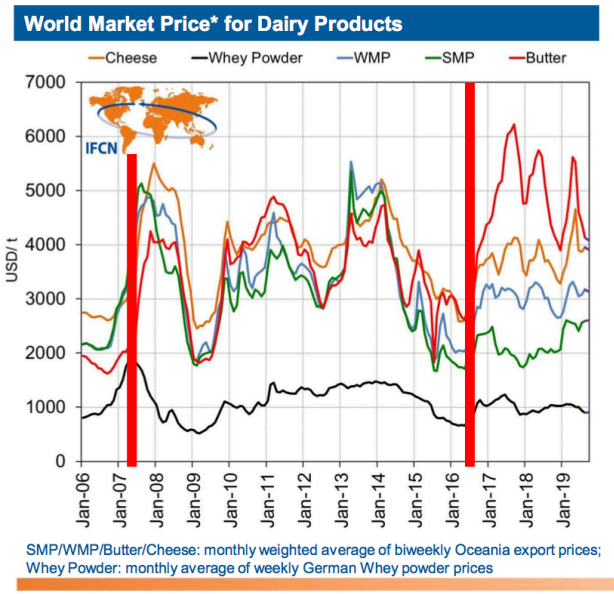


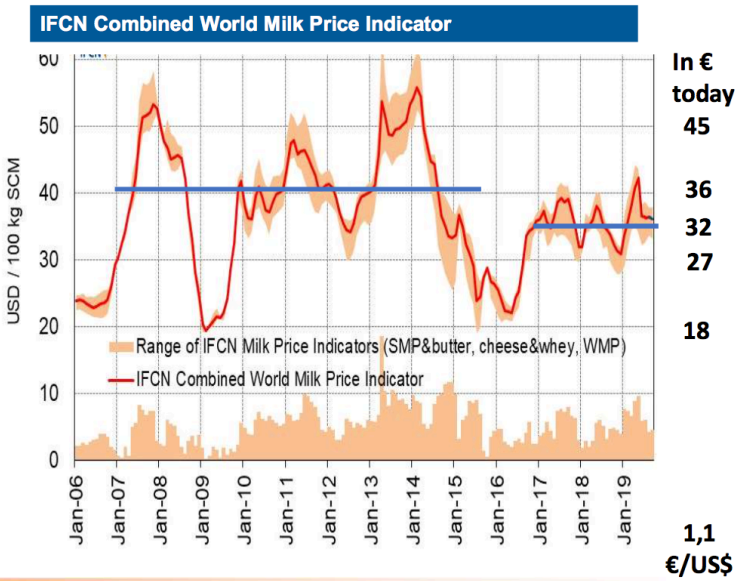


https://indiadairy.com/latest_news/indias-dairy-exports-up-126-in-fy19/

Dairy: Highly Volatile Global Markets

World market prices of dairy products and "milk"





Relentless Cycles of Booms and Busts: every bust pushes out the smallholders Dairy Processers offload excess SMP stocks: Domestic and International (2015-2018). Export subsidy support by GOI to processers

Threats and often closure of smaller dairy processers and consolidation and expansion of the large

Mismatch of Science and reality :coping with climate crises

- Small Farmers: de-intensifying their production (HF to Hallikars; revert to multifunctional livestock and crop production, agro-ecological diverse cropping for food, machinery to draught, fertilisers to manure; equitable (Ramdas, 2018)
- Decentralised local collective marketing (distance of 25-30kms) more resilient to the booms and busts (FSA, 2017)

Data Gap: Intensification the Magic Wand ?

- Recent Studies Mathieu et al (2019): highlight that intensification across 8 Dairy Production Systems in India, whilst having lower GHG emissions/lite milk, led to overuse of Fossil Energy, water, loss of crop-livestock interactions with uncalculated environmental impacts

- Aubron et al (2019): Excessive annual N2 surplus at the village (Gujarat): 1040 kg N2 ha. Heavy reliance of external inputs: Fertilisers and Feed concentrates. Equal to Europe scenario. Draught replaced by tractors. Recent Census too reveals -29% decline in indigenous male cattle

- Differential contribution to the surplus: Highest by Large landowners who lease out land, Large Dairy farmers, Mid-level diversified farms. 0 contribution by pastoralists and daily wage labour.

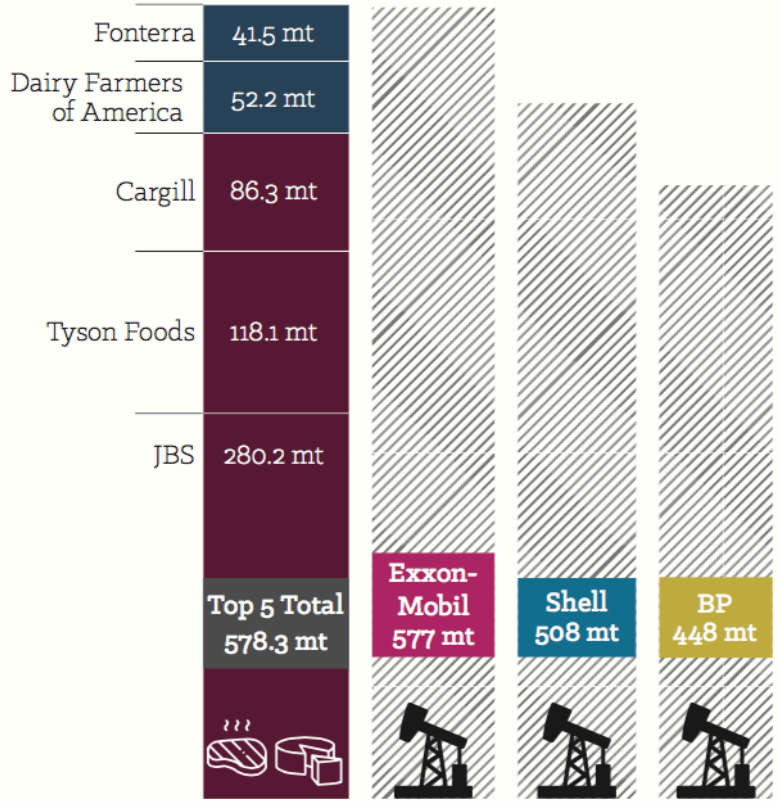
- Wealth in dairy is not reaching the S&M and landless labour, who continued to remain poor; Threat from large dairy farms and enclosures (privatization of land and pastures)

Missing emissions data: Supply chain emissions of Dairy/ Meat

Of 35 largest, 6 have targets with supply chain emissions. These emissions can account for up to 90% of total emissions. The same 6 are pushing for growth in production and exports- drives their overall emissions up regardless of their intention to reduce emissions per kilo of milk or meat produced.

This absence in emissions assessment holds equally true in the Indian context with respect to Dairy processers: expand, export, grow

FIGURE 4: The top 5 meat and dairy companies combined emit more greenhouse gases than ExxonMobil, Shell or BP



Sources: GRAIN & IATP. See Appendix, Methodology Note, section B. Griffin, Dr. Paul, "The Carbon Majors Database: CDP Carbon Majors Report 2017," CDP, 2017, http://bit.ly/carbon-majors-report.

The Big Gaps: and Concern

Absolutely no assessment of Indian beef. Indian beef a by-product of dairy, and officially entirely derived from buffaloes, which also anchor India's milk production: possibly least environmentally damaging beef globally today, as both products from identical population base. Beef important source of animal protein for a large number of Indians.

- Rising stray cattle in States that have slaughter bans: a massive ecological and economic burden: (MP: 2012: 437,910; 2019: 853,971)

- Economies of scale and intensification have not addressed the protein needs of the poor. 2017-18: per capita milk 375 gm/day (275 gm/d)

  NSSO consumption data (2011-2012), milk consumption amongst India's rich and middle classes is nearly 6.8 times higher than that of the very poor and 3.3 times higher than the poor. Meat:<5kg/cap/yr.

  2019: 10% decline in rural consumption exp on food.

- With S& M farmers being driven out of bovine farming livelihoods, can we really expect increase in animal-based protein consumption ?

- Massive increase in the dairy industry is responding to the demands of an already overfed wealthy class and not minimal nutritional needs