

# Livestock and Sustainability

Challenges to sustainable livestock production



# Learning Objectives:

1. Enumerate the importance of livestock for food security, poverty reduction and resilience
2. Identify the global livestock systems
3. Characterize the dynamics of livestock with the following: sustainable land management, gender and climate change

# This presentation covers the following topics:

- Quick facts about livestock
- Livestock population in ASEAN
- Importance of livestock
- Some definitions
- Global Livestock Systems
- Demand for Livestock Products
- Livestock revolution
- The Livestock – SLM Dynamics
- The Livestock – Gender Dynamics
- The Livestock – Climate Change Dynamics

# QUICK FACTS

- Approx. 80% of the world's 1.3 billion poor people live in rural areas
- $\frac{2}{3}$  of them keep livestock



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- 70% of them are women

**Table 1: Livestock Population in ASEAN countries**

(in thousands)

Country	Human Population	Chicken	Duck	Buffalo	Cattle	Pig	Goat
Brunei	409	16000 F	220 F	4.6 F	1 F	1.3 F	2.7 F
Cambodia	14 952	17 448	7 000F	702	3 484	2 057	
Indonesia	248 216	1 622 750	45 292	2 005	13 63	7 212	16 821
Lao PDR	6 586	23 000F	3 200 F	1 200 F	1 400 F	3 400 F	289 F
Malaysia	29 180	225 790	48 200 F	130	909	1 711	537
Myanmar	54 584	125 000 F	12 600 F	3 000 F	13 000 F	7 900 F	2 750 F
Philippines	103 775	158 984	10 268	3 270	2 570	13 398	4 177
Singapore	5 353	3 300 F	750 F	..	0.2 F	270 F	0.7 F
Thailand	67 091	231 918	29 233	1 622	6 498	7 623	380
Viet Nam	91 519	218 201	68 633	2 913	5 916	27 373	1 288

F = FAO estimate

Source: FAOSTAT | © FAO Statistics Division 2010



# Importance of Livestock

1. Multiple benefit
2. (Regular) income generation
3. Human nutrition
4. Use of marginal landscapes / weed control
5. Transfer of plants into food
6. Financial security
7. Socio-cultural importance



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# Livestock. Some definitions

## Ruminants

A multi stomached animal. Uses a set of stomachs. Digests plant fibre and requires little plant protein. Instead, protein is build up from ammonia in the form of rumen microbes which live and feed in the rumen.

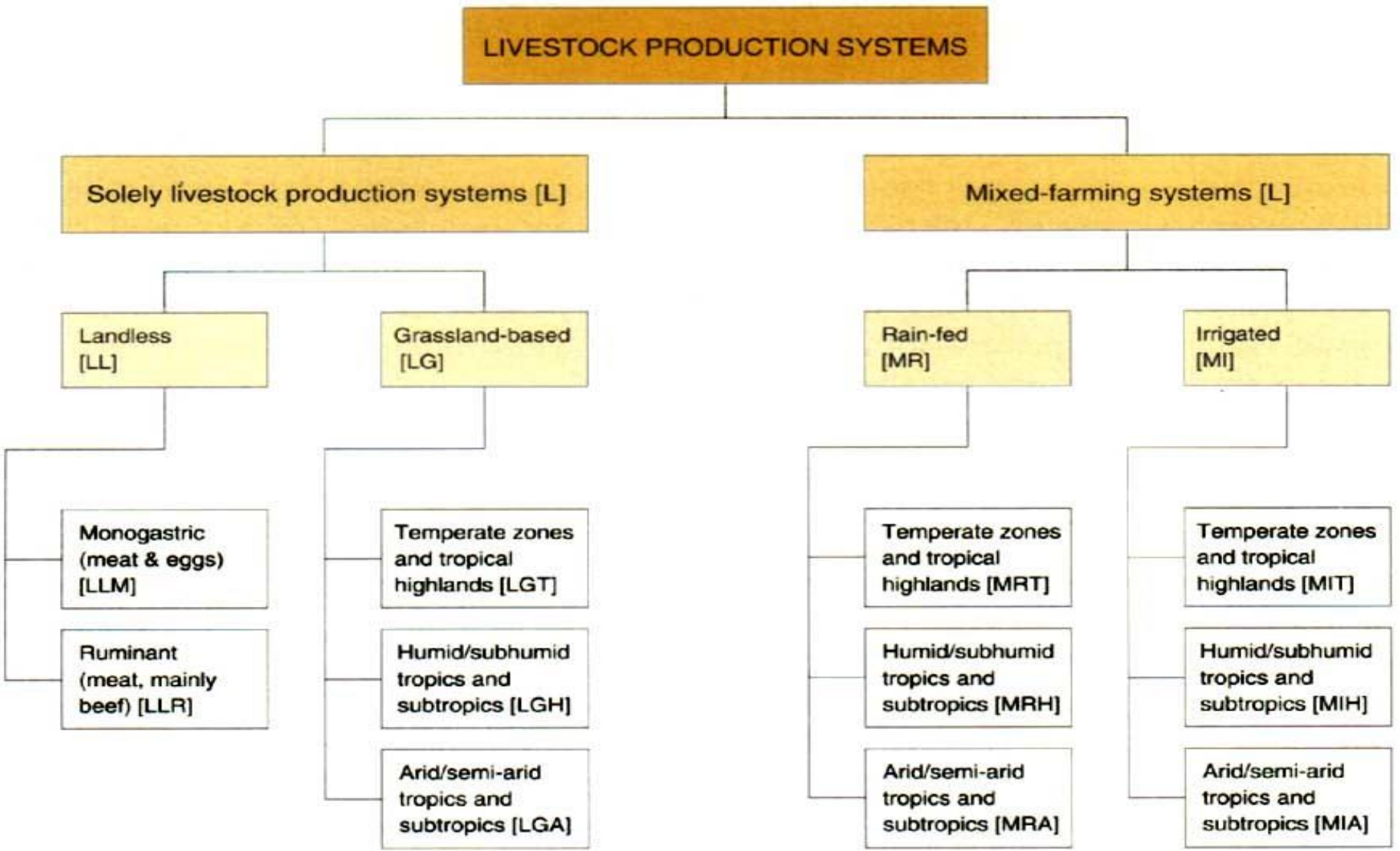
- Cattle, Goat, Sheep, Buffalo, Deer,

## Non-ruminants:

Single stomached animal are monogastrics. Require high concentration protein feed for production.

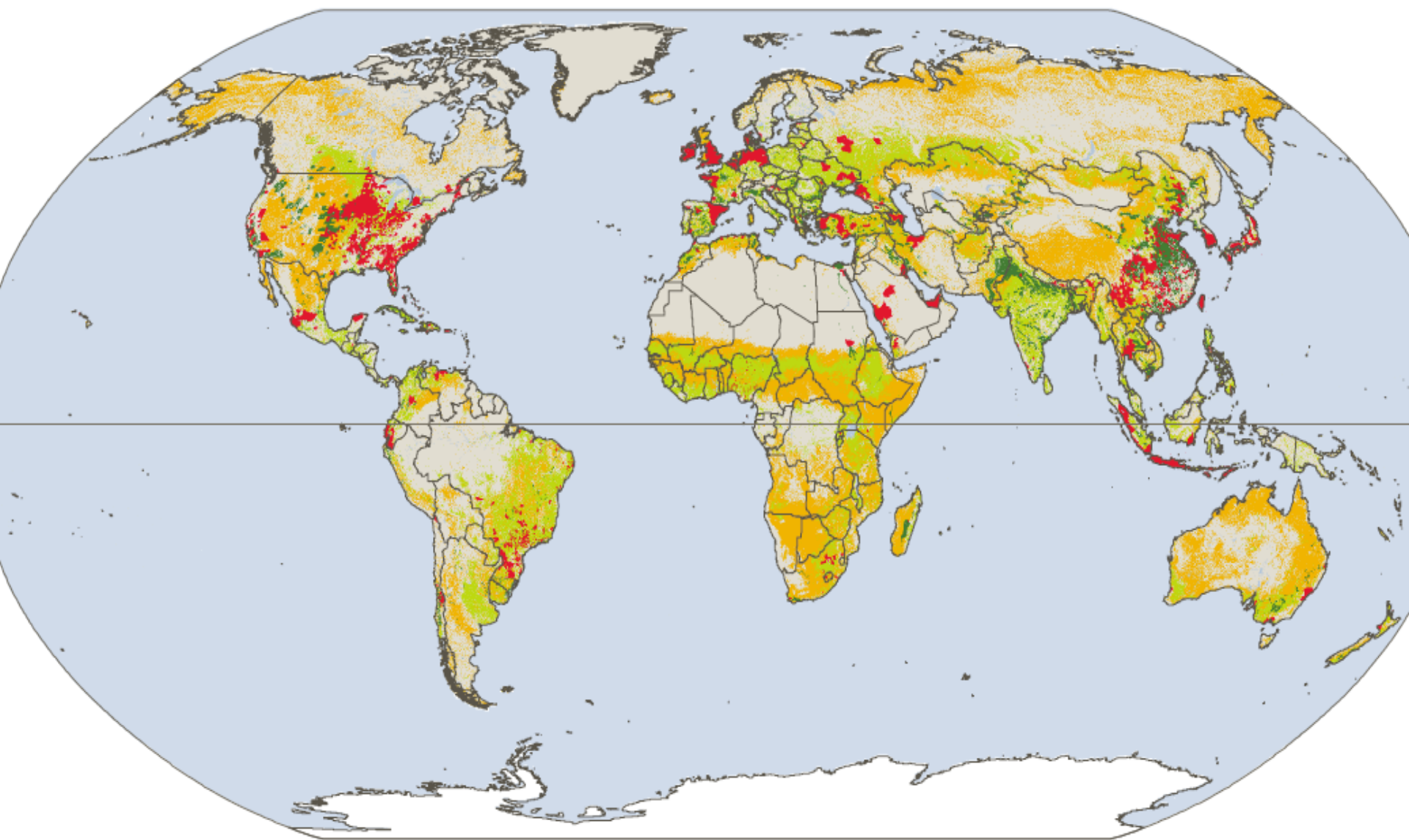
- Pig, Chicken and other Poultry (Equines)

# Global Livestock Systems



Livestock's long shadow. FAO 2006.





**Livestock production systems**

- |  |                  |   |            |   |  |   |                     |
|--|------------------|---|------------|---|--|---|---------------------|
|  | Mixed, irrigated |  | Grazing    |  | Areas dominated by landless production |  | National boundaries |
|  | Mixed, rainfed   |  | Other type |  | Boreal and arctic climates             |   |                     |

Livestock's long shadow. FAO 2006.

# Categories of Livestock PRODUCTION Systems – ASEAN Context

## 1. Production for own/Domestic Consumption

- Minimal number of animals raised
- Surplus may be sold for cash income

# Categories of Livestock PRODUCTION Systems – ASEAN Context

## 2. Commercial Production

- More developed production system and standard in housing
- With volume and has more bargaining power

# Categories of Livestock PRODUCTION Systems – ASEAN Context

## 3. Industrialized/Intensive Production

- Large volumes with sophisticated technology
- Most contract farmers



What role for  
livestock do you see  
in sustainable  
agriculture?



Livestock systems and Production	Grazing Systems		Mixed Systems			Landless Systems	
			Rainfed	Irrigated	Combined		
<i>Livestock numbers (Mio heads)</i>							
Cattle & Buffaloes	406	27%	641	450	71%	29	2%
Sheep & Goat	590	33%	632	546	66%	9	1%
<b>Total heads</b>	<b>996</b>		<b>1273</b>	<b>996</b>		<b>38</b>	
<i>Production (Mio. tonnes)</i>							
Beef	15		30	13		4	
Mutton	4		4	4		1	
Milk	72		320	203		1	
<b>Total production</b>	<b>91</b>		<b>354</b>	<b>220</b>		<b>6</b>	
Production/Head coefficient	1/11		1/3.5	1/4.5		1/6	

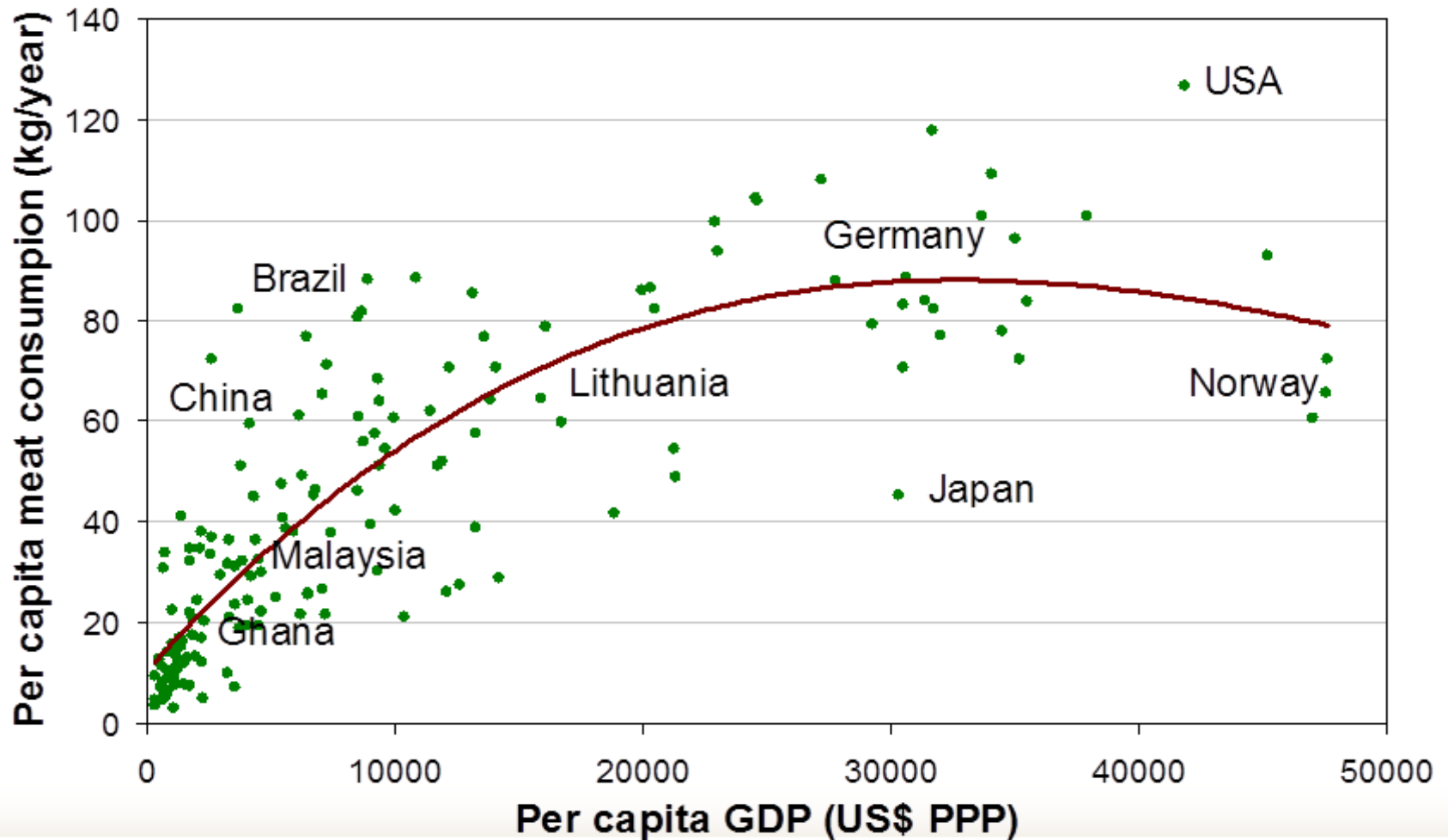
Adapted from: Rae, A. and Rudy Nagya. 2010.

# Demand for Livestock Products – An Opportunity

	2010	2020	2030	2050	2050 /2010
<b>Global</b>	In Mio. Tonnen				In %
<b>Total meat consumption</b>	268,7	319,3	380,8	463,8	173
<b>Beef</b>	67,3	77,3	88,9	106,3	158
<b>Mutton</b>	13,2	15,7	18,5	23,5	178
<b>Pork</b>	102,3	115,3	129,9	140,7	137
<b>Poultry</b>	85,9	111	143,5	193,3	225
<b>Dairy products (without butter)</b>	657,3	755,4	868,1	1038,4	158
<b>Developing countries</b>					
<b>Total meat consumption</b>	158,3	200,8	256,1	330,4	209
<b>Beef</b>	35,1	43,6	54,2	70,2	200
<b>Mutton</b>	10,1	12,5	15,6	20,6	204
<b>Pork</b>	62,8	74,3	88	99,2	158
<b>Poultry</b>	50,4	70,4	98,3	140,4	279
<b>Dairy products (without butter)</b>	296,2	379,2	485,3	640,9	216



## Livestock Products – A Question of Wealth





# The livestock revolution – Present Trends

1. Growing global demand for livestock products
2. Intensification and industrialization
3. Globalization is boosting trade in livestock inputs and products
4. Human's ability to control production environments
5. Shifts from subsistence-level livestock keeping to market-oriented production



# The livestock revolution - Present trends

6. Modern reproduction techniques like AI (Artificial Insemination)
7. Global availability of genetic material
8. Extensive grazing still occupies vast areas of land
9. Shifts towards sedentarization and disintegration of pastoralism
10. Niche markets and specialty markets for high-value livestock products from local breeds have emerged

# The Livestock – SLM\* Dynamic

- Approximately 70% of all agricultural land in the world is used for livestock!
- Overgrazing is the major cause of degradation of grasslands
- 35% of total world cereal use is fed to livestock and more than 90% of the global soybean production is used as animal feed.



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\*= Sustainable Land Management

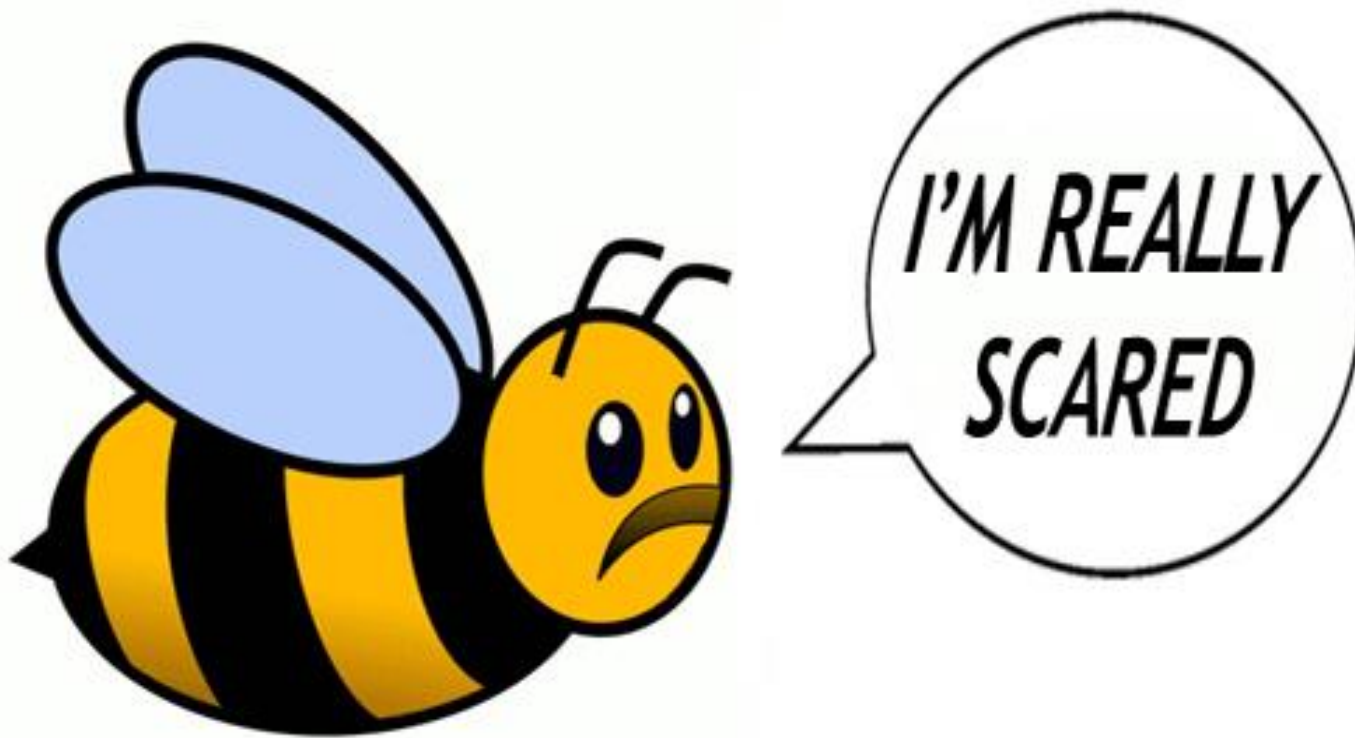
# The livestock - bees

- Honey is produced since more than 15.000 years
- As pollinators they strongly influence ecological relationships, ecosystem conservation and stability, genetic variation of plant community
- Important source of income
- Niche production
- Storage of honey with low risk
- Medicinal and nutritional value



**LITTLE RECOGNITION**

Bee Products Biodiversity Bumble bee Bumblebees Caffeine  
Charles Darwin Colony collapse disorder CSIRO DNA Easton  
College EU Eudicots Evolution Extinction Gardens Genetics Hive  
Beetle Hornets Neonicotinoids Pesticides Pheromone Queen  
breeding



**LITTLE AWARENESS**



# The Livestock – Gender Dynamic

- Sustainability in livestock production has a strong gender based determinant
- Often women and men occupy socially determined roles in the livestock sector in many countries



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- This makes development interventions in the livestock sector gender sensitive

# The Livestock – Gender Dynamic

Women	Men	Children
Releasing and tethering animal	Working animals in the field	
Cleaning sheds	Building sheds	
Feeding and watering		Grazing
Bringing fodder		
Milking and boiling milk	Milking	
Managing calves	Getting animals crossed	
Administering household remedies, calling Vet. if required	Administering medicine, calling Vet. if required	
Giving advice to men in the sale of animals	Sale of animals	
Safekeeping of money after animal sale		
	Castration of animals, slaughtering	

A work schedule of a livestock system in India. It reflects differing responsibilities in the sector. Such responsibilities will be affected differently by development interventions as well as impact from climate change.

# The Livestock – Climate Change Dynamic

- GHG emissions along livestock supply chains estimated at 7.1 gigatons CO<sub>2</sub> per annum
- Represents 14.5% of all anthropogenic emissions



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# The Livestock – Climate Change Dynamic

## Sources of sector emissions (global):

1. Processing and enteric fermentation 45 %
2. Feed production 39 %
3. Manure storage and processing 10 %
4. Processing and transportation of animal products 6 %

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# The Livestock – Climate Change Dynamic

## IN ASEAN:

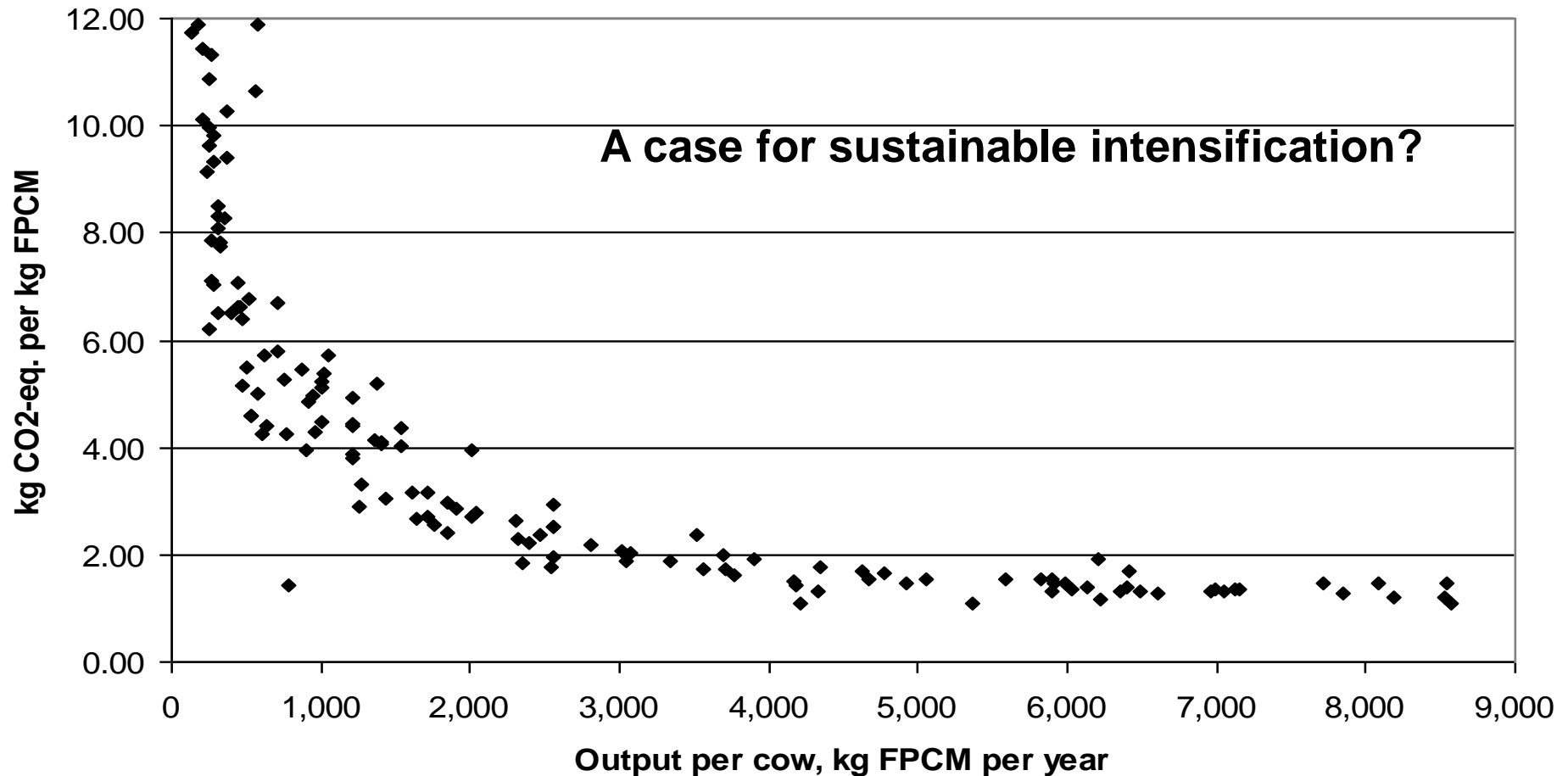
1. Enteric fermentation 52%
2. Manure Management 20%
3. Manure put on soil 9%
4. Manure left on pasture 19%



**% share of livestock in ASEAN agriculture: 31.2%**

# The Livestock – Climate Change Dynamic

## Relationship: total greenhouse gas emissions and milk output





## Keywords

- Importance of Livestock for Poverty Reduction
- Global Livestock Systems
- Livestock Systems and Production
- Demand for Livestock Products
- The Livestock – SLM Dynamics
- The Livestock – Gender Dynamics
- The Livestock – Climate Change Dynamics



# Thank you!

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