

ENVIRONMENTAL PERFORMANCE OF THE DAIRY SECTOR

Towards an environmentally sustainable dairy sector

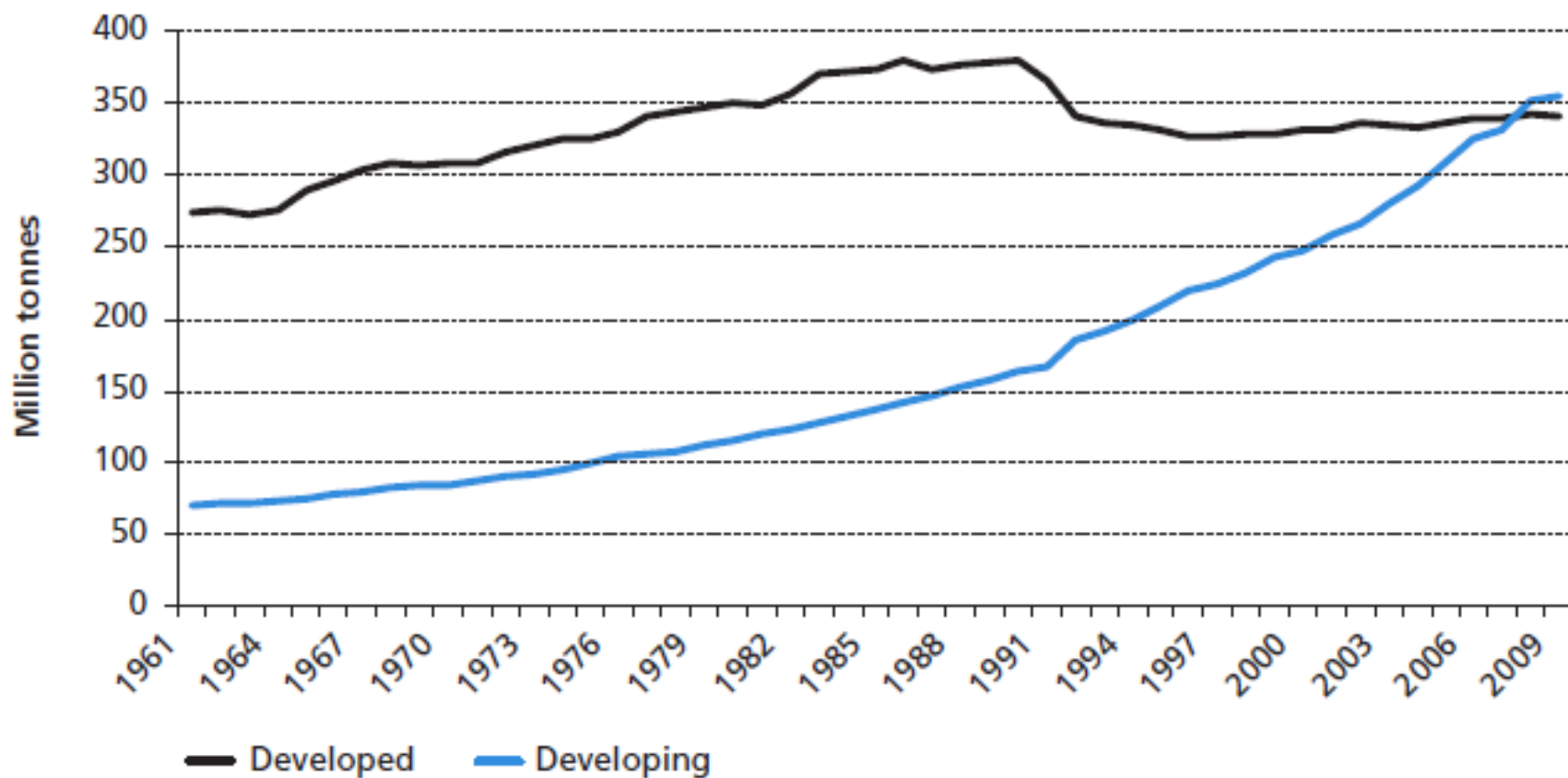
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Outline

1. Snapshot of global trends in the dairy sector
2. Implications for future food landscapes – opportunities and threats
3. Challenges facing the dairy sector
4. Major environmental concerns
5. FAO's initiatives to improve environmental performance of dairy sector

Dairy snapshot

Converging trends in global milk production



Dairy snapshot

Average annual growth rates in trends in dairy production and consumption

Future growth expected in developing regions: East Asia and South Asia

Region	Production (%)			Consumption (%)		
	1991–2007	2005/07–2030	2005/07–2050	1991–2007	2005/07–2030	2005/07–2050
<i>Developing countries</i>	4.2	2.1	1.8	3.9	2.1	1.7
<i>East Asia</i>	9.5	2.2	1.5	7.9	2.2	1.5
<i>Latin America and Caribbean</i>	3.3	1.7	1.3	2.6	1.5	1.1
<i>Near East and North Africa</i>	3.1	1.9	1.7	2.8	1.9	1.6
<i>South Asia</i>	4.1	2.3	2.0	4.1	2.3	2.0
<i>Sub-Saharan Africa</i>	3.5	2.4	2.3	3.5	2.5	2.3
<i>Developed countries</i>	0.0	0.5	0.3	-0.1	0.5	0.3
<i>World</i>	1.6	1.3	1.1	1.6	1.3	1.1

Drivers of consumption and future trends

World demand for livestock food products since 1990:

Milk +30% Meat +60% Eggs + 80%
+70% by 2050

Population growth : +30% since 1990
+30% or 9.6 billion people by 2050

Income growth : +1.5%/year since 1980, +5 to 7%/ year in Asia
+2%/year by 2050

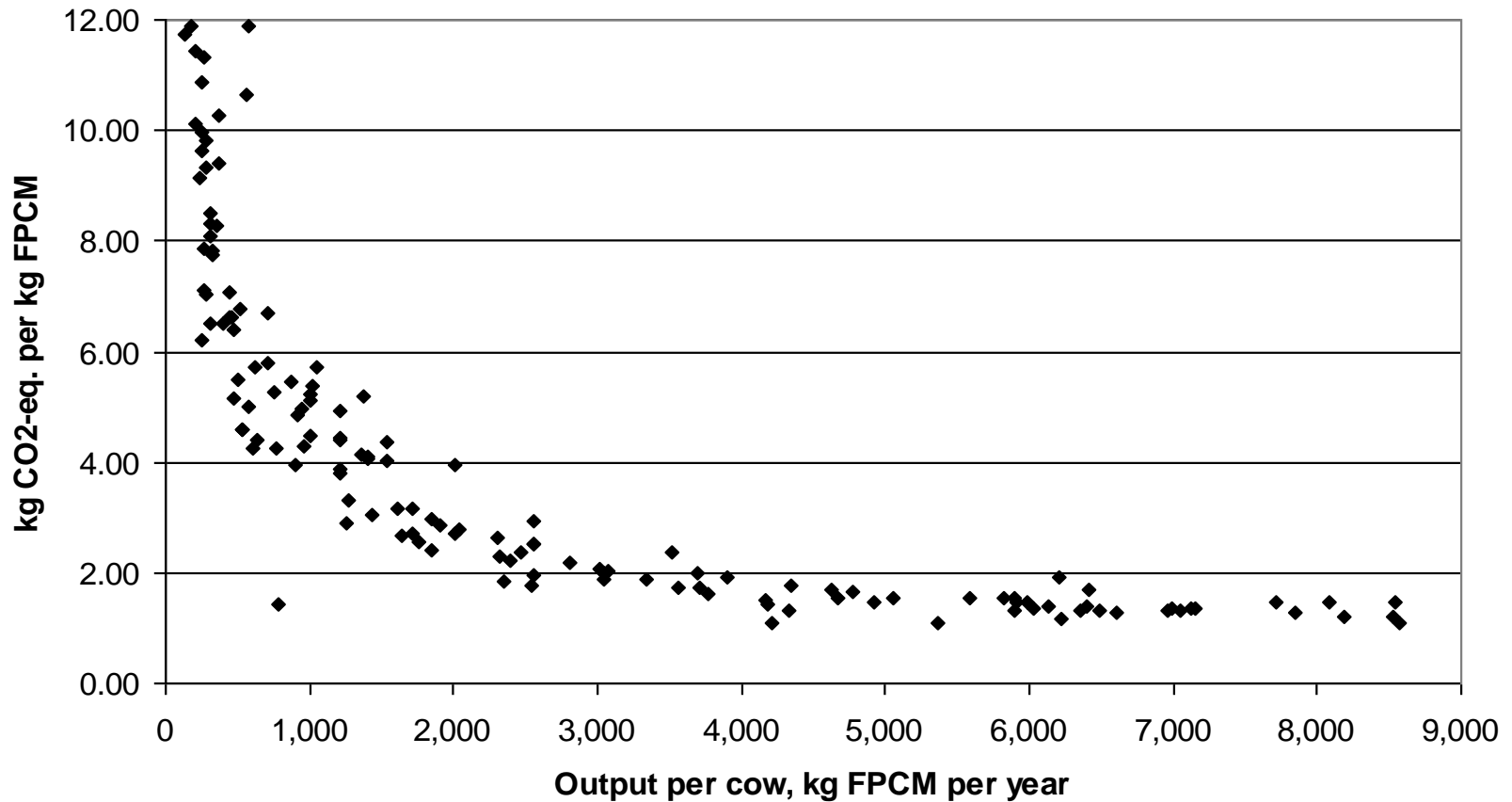
Urbanization: 20% in 1900, 40% in 1990, >50% in 2010
70% of urban people in 2050

Implications for future food landscape: *opportunities and benefits*

- increasing demand and consumption will translate into nutritional and health benefits
 - dairy products a major source of animal protein, and other micronutrients
- growth of the sector presents a potential for social and economic gains
 - over 80 percent of dairy animals in the region are raised by smallholders
- opportunities to improve the environmental sustainability of sector >> improvements in productivity

Emission intensity and milk production

GHG benefits of increasing milk productivity



Implications for future food landscapes: *constraints and uncertainties to feeding 9 billion+*

- Increasing resource scarcity (energy, water) and competition for resources (feedstock, land)
- Uncertainty associated with a rapidly changing climate and its impacts on livestock production
- Negative policy interventions e.g. biofuel policies and impacts of rising demand for bio-energy on food prices and inputs
- Uncertainty for both consumers and producers due to increasing prices – high prices for consumers; increasing costs for farmers

Challenges

- Demand will continue to grow and needs to be accommodated within a context of finite resources >> produce more with same or less
- Scarcity of resources (water, energy, land) will shape future food production
- Resource supply constraints (land, water, energy) and climate change will result in larger and more frequent shocks to dairy food chains >> adaptation is a necessity
- Increasingly as issues of environmental sustainability take root, the sector will have to reduce its environmental footprint

Challenge....

increase productivity to meet food demands while minimizing environmental impact

Major environmental concerns

- The livestock sector is resource hungry (land, water, nutrients, energy)
- The sector has specific resource issues
 - characterized by low NRU efficiency
 - geographic dispersion (extensive systems) and geographic concentration (intensive systems)
 - wastage along the supply chain (mortality from disease, feed waste, milk wastage, etc.)
- Sector exerts pressure on NRs and environment e.g. land, water, biodiversity through pollution, degradation, land use change, GHG emissions

Future directions and how we can work together?

Need for collective, concerted and global action

- Size and complexity of the sector, increasing global economic integration
- Global public good nature of the environment – global solutions
- Assessment of livestock's impact on the environment and benchmarking: requires methods and common metrics

Partnership on the environmental benchmarking of livestock supply chains

Rationale

- The absence of clear internationally agreed sector specific methodology and guidance to measure the environmental performance of livestock supply chains.
 - ...leading to confusing messages and distracts from main focus on improving environmental performance
- Need to build a broadly accepted framework to guide and monitor progress
 - environmental performance and benchmarking on the horizon
 - ...you can only manage what you measure!

www.fao.org/partnerships/leap



Why we need guidance and methods

- Improves consistency, comparability, and credibility
- Simplifies measurement & monitoring of performance
- Promotes harmonization across the sector in performance assessment
- Accepted by stakeholders within the sector: Industry, NGOs, and Governments

What is specific to the LEAP Partnership?

- Focus is on livestock supply chains
- Develops harmonized metrics and methods to guide environmental performance improvement – benchmarking and monitoring
- Focus is on range of environmental criteria: GHG emissions, nutrient cycles, water, biodiversity
- Multi-stakeholder initiative: governments, civil society and private sector



Key principle

- Relies on evidence-based dialogue and consensus for sustainability improvement
 - Common metrics need to be both science-based and agreed (negotiated) among stakeholder

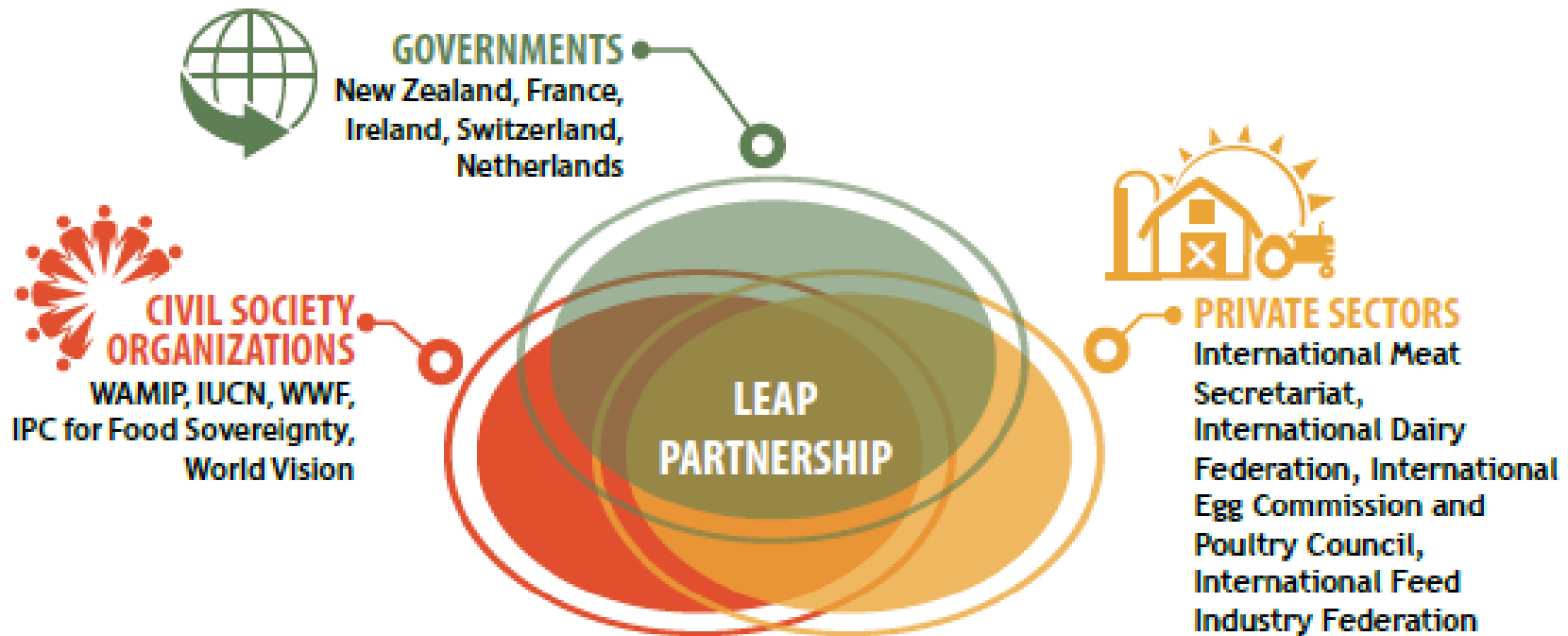
This principle is shared with the **Global Agenda for Sustainable Livestock**, the umbrella under which LEAP is nested

The process

- science based life-cycle approaches - supply chain
- utilizes leading expertise from around the world to develop sector-specific guidance
- focuses on tangible outputs – databases, guidelines, methods
- identifies opportunities to work with other international processes



Who is involved in LEAP?



* Representatives of the three stakeholder groups may evolve as new organization join the Partnership

- Steering Committee: 3 stakeholder groups represented with equal say
- Observers on SC: ISO, UNEP, IWTO, EU
- Secretariat hosted at FAO
- Participation is open and voluntary: members recognize the objectives and principles of the partnership

The actions of the partnership

2012-2015



PHASE 1

Common principles and core approaches

- Project plan
- Launch of LEAP (July 2012)

- Common principles and elements
- Communication strategy

PHASE 2

Development of GHG/Environmental assessment guidance

- Small Ruminants (goats and sheep) TAG*
- Animal Feeds TAG
- Poultry TAG
- Development of feed database
- Biodiversity methodology review

PHASE 3

Development of GHG/Environmental assessment guidance

- Large Ruminants TAG
- Swine TAG
- Feed database and platform live trial
- Biodiversity TAG
- Water methodology review

PHASE 4

Methodology improvement and wider environmental impacts

- Nutrient use efficiency project
- Water TAG
- Case studies and review
- Data and methodology improvement

PHASE 5

Review and evaluate

- Environmental assessment guidelines published
- Feed database and platform completed
- Evaluation and next steps

* TAG: Technical Advisory Group

The activities – 1. Sector specific guidelines

- 3 draft sector specific guidelines
 - Poultry
 - Small ruminants
 - Animal feed
- Under preparation:
 - large ruminants (dairy and beef, buffalo);
 - impact of livestock on biodiversity



Purpose: to provide a comprehensive definition of methods and guidance needed to enable a consistent application of LCA across the diversity of livestock supply chains

- developed by a group of experts in production systems, LCA

The activities – 1. Sector specific guidelines

- focus is on environmental performance
- current guidance for a select number of environmental impact categories
 - climate change (all 3 guidelines)
 - fossil energy demand (Poultry and Small ruminant)
 - acidification, eutrophication, land use (Animal feeds)
- guidance designed to be applicable in all contexts or situations: production systems and supply chains in different countries and regions

The activities – 2. To develop a database on GHG emissions from feed production

- Focus is on major crops used for feed
- Particular attention to the quantification of emissions arising from land use and land use change. First version of database by the end of 2014 for:
 - Maize
 - Soybean
 - Wheat
 - Barley
 - Cassava

Crop:

RegionType:


Region:

Country:

Agro Ecological Zone:

Production System:

Production Practice:



Life Cycle Inventory (LCI)

Seed rate	1851.3	kg / ha
Organic fertilizer	5778.2	kg N / ha
Artificial fertilizer	2311.3	kg N / ha
Urea	0.034	AN 0.13 -
Nitrate sol.	0.227	CAN 0.22 -
NPK	0.132	AP 0.15 -
Anh. NH ₄	0.062	AS 0.05 -
Lime	577.8	kg / ha
Phosphorous	1155.6	kg / ha
Pesticides	11556.4	kg Al / ha
Ploughing	1	# / yr
Seedbed preparation	1	# / yr
Seeding	1	# / yr
Organic fert. Application	1	# / yr
Synthetic fert. Application	1	# / yr
Pesticide spraying	2	# / yr
Weeding	1	# / yr
Irrigation	3	# / yr
Harvesting	1	# / yr
Yield	138676.7	kg DM / ha

GLEAM output

Seed	37.03	kg CO ₂ -eq / kg DM
Organic fertilisation	196.46	kg CO ₂ -eq / kg DM
Synthetic fertilisation	1178.75	kg CO ₂ -eq / kg DM
Energy use	61.63	kg CO ₂ -eq / kg DM
Crop protection	177.72	kg CO ₂ -eq / kg DM
Land work	318.96	kg CO ₂ -eq / kg DM
Total excl. LU/LUC	1970.55	kg CO ₂ -eq / kg DM
Land use	0.22	kg CO ₂ -eq / kg DM
Land use change	0.24	kg CO ₂ -eq / kg DM

The activities - 3. Communication

Objective: contribute to improving communication on sustainability and progress in environmental performance

More specifically:

- ensure broad use of the products: guidelines and databases
- coordinate with partner initiatives and position LEAP
- enlarge membership



This is a screenshot of the LEAP Partnership website. The top navigation bar is green with the text 'Livestock Environmental Assessment and Performance (LEAP) Partnership'. The main content area features a large image of a herd of cows in a green field. To the left of this image is the FAO logo and the text 'Food and Agriculture Organization of the United Nations'. Below the main image, there is a 'Goals and objectives' section with text describing the partnership's mission. To the right, there is a 'LEAP BROCHURE' section with a small image of the brochure and a 'Download (pdf - 636 Kb)' link. At the bottom, there is an 'UPCOMING EVENTS' section listing a meeting on 4-5 March 2014. The footer contains logos for CO2iSIC, Agriculture, Food and the Marine, New Zealand Government, and Ministry for Primary Industries.

Challenges

- Ensuring international input from diverse farming and supply chains – difficulty in capturing heterogeneity of sector
- Impact categories for which science is still in development, e.g. biodiversity, water
- Enlarging membership – participation of developing countries still low.

Opportunities and linkages

- Level of engagement and commitment of stakeholders in the sector >> magnifies impact
- Level of technical expertise that LEAP is able to tap into
- Complementarities with several related initiatives
- Positioning under the broad umbrella of the Global Agenda of Action for sustainable Livestock which focuses on a much broader framework



GLOBAL AGENDA OF ACTION

IN SUPPORT OF SUSTAINABLE LIVESTOCK SECTOR DEVELOPMENT

www.livestockdialogue.org

- **Multi-stakeholder** partnership committed to sustainable livestock sector development
- **Continuous improvement** of natural resource use
- Links three **BIG** challenges of our time
 - Resource Scarcity
 - Demand growth
 - Poverty
- **Addresses** unprecedented challenges
- **Unites** the forces of all sector actors
- **Focuses on** themes with a high potential for change (NRUE, grassland restoration, and manure management)
- **Informs, guides and catalyzes** practice change
- **Supports** innovation and investment in viable sector solutions

Thank you