The Climate and Clean Air Coalition (CCAC) Measures to Reduce Methane Emissions from the Agriculture Sector - the Link to Nitrogen

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Outline of Talk

- Describe the Short-Lived Climate Pollutant (SLCP) issue and the formation of the Climate and Clean Air Coalition (CCAC)
- Describe the nitrogen related projects of the CCAC in the agricultural sector
- Outline the potential links to LRTAP and TFRN

The SLCP Challenge and Opportunity

The main SLCPs are **BC, CH_4, tropospheric O_3 and some HFCs**:

- Relatively short lifetimes in the atmosphere
- Responsible for a substantial fraction of climate change
- For some detrimental impacts on health, agriculture and ecosystems

16 measures identified in UNEP reports for mitigating BC and CH_4:

- 2.4M lives saved globally each year (outdoor air pollution only)
- 32M tonnes avoided losses from four major crops each year
- Reduce global warming by 0.5°C by 2050
- No technical breakthroughs required
- Half the reductions at low cost or cost-neutral

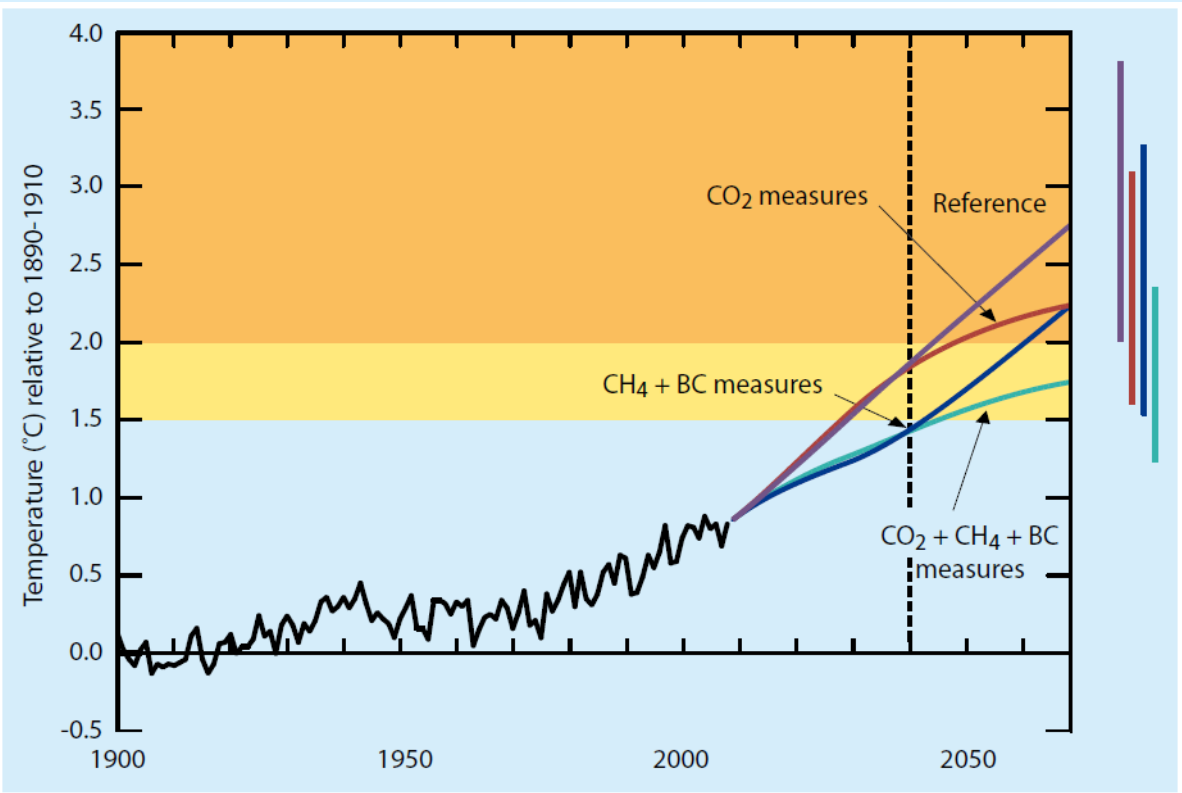
Additional measures with additional gains from mitigating HFCs (0.1°C by 2050)

Fast action on SLCPs can significantly increase public health, food and energy security, and reduce near-term climate change.

Why complementary strategies for CO_2 and SLCP measures?

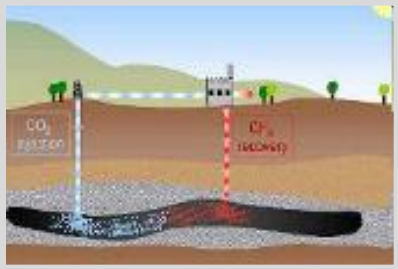
0.5°C Reduction by 2040
BC+Methane+Ozone

A fast reduction in emissions of black carbon and methane may give substantial climate benefits over the next 20-40 years with co-benefits for human health, crops yields and regional climate



Shindell et al., *Science*, (2012)

SLCP Measures



Methane

- Degasification, recovery and use
- Recovery from municipal waste & wastewater treatment
- Reduce emissions from agriculture

Black carbon

- Improve stoves (biomass to LPG/biogas, wood to pellet)
- Upgrade brick kilns
- Use particle filters for diesel vehicles

HFCs

- Non-HFC technologies for refrigeration
- Low-GWP, high energy-efficient foam blowing technologies
- Efficacy for cooling technologies

16 measures:

- ✓ ≈- 40% methane, ≈- 80% BC in 2030 (rel. to BAU)
- ✓ No technical breakthroughs
- ✓ Already implemented in many countries
- ✓ Half reductions at low cost or cost-neutral

- ✓ No ‘one-size-fits-all’ solution
- ✓ Further R&D for effective and affordable alternatives and relevant infrastructure

Translating the Science into Policy and Action

"If someone proposed that you could save close to 2.5 million lives annually, cut global crop losses by around 30 million tonnes a year and curb climate change by around half a degree Celsius …

what would you do?"

"**Act** of course …"

Achim Steiner
Executive Director
United Nations Environment Programme (UNEP)

The CCAC

- **Leverage high-level engagement and political will, and catalyze action to address SLCPs as a global and collective challenge** to protect the environment and public health, promote food and energy security, and address near term climate change
- **Voluntary, Partner-led Coalition**
  - Feb 2012 -> 6 Partners
  - Feb 2014 -> 80 Partners: 36 States, IGOs, NGOs and private sector
- **Science driven, action-oriented**
- **Building on and bringing together existing efforts**
- **Complementary to global efforts to reduce CO_2 in particular under UNFCCC**

High impact Initiatives

Heavy Duty Diesel Vehicles and Engines	Municipal Solid Waste Sector	Brick Production	Promoting HFC Alternative Technology and Standards	Oil And Natural Gas Production
Household Cooking and Domestic Heating	Financing Mitigation of SLCPs	Supporting National Planning for Action on SLCPs (SNAP)	SLCPs Regional Assessments	Agriculture

- **Celebrating first success!**
- About USD 50 Million pledged and over USD 15 Million already allocated to specific activities under the initiatives

Addressing Short-Lived Climate Pollutants (SLCPs) From Agriculture

- The objective is to share and implement best practices for minimizing emissions of SLCPs from agriculture
- in a manner that is consistent with broader climate change objectives and that also enhances food security and livelihoods
- SLCPs from agriculture **include methane emissions (e.g., from livestock and rice production**) and black carbon emissions (e.g. from agricultural burning and subsequent wildfires, and especially in regions where smoke plume distribution is over snow and ice)

Mitigating Methane Emissions from Paddy Rice

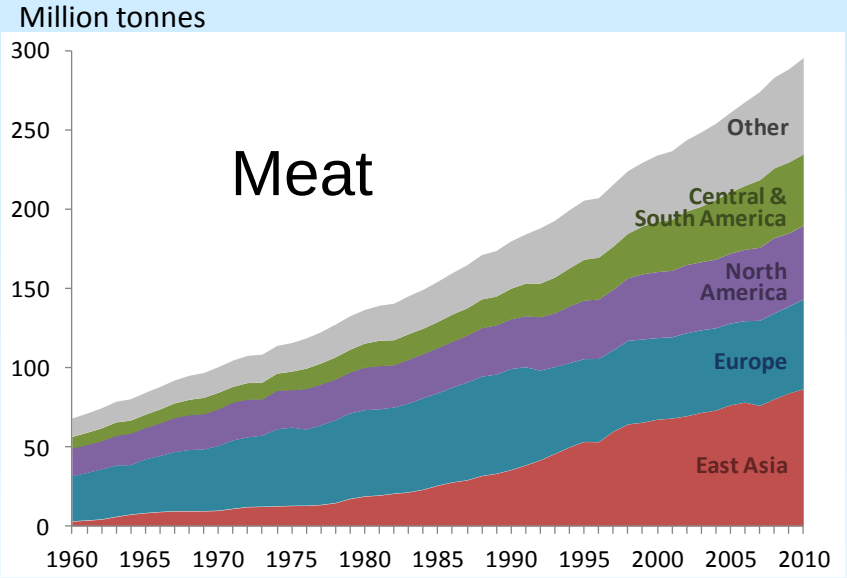
- Focus on alternate wetting and drying (AWD) in irrigated rice, the most well-developed technology for mitigating GHG emissions in rice systems
- It will assess direct seeding, ground cover management, **nutrient management, nitrogen use efficiency**
- Expected to yield up to 30% reduction in methane emissions intensities (CO_2e/kg rice) from eligible rice systems, as well as improve rice yields and **efficiency of nitrogen fertilizer use**, while reducing production costs, water use, and fuel required to pump water
- Methane in rice fields has been well studied. At least 300 peer-reviewed scientific journal articles have appeared since the 1990s documenting the factors that affect methane, **nitrous oxide**, and carbon dioxide emissions

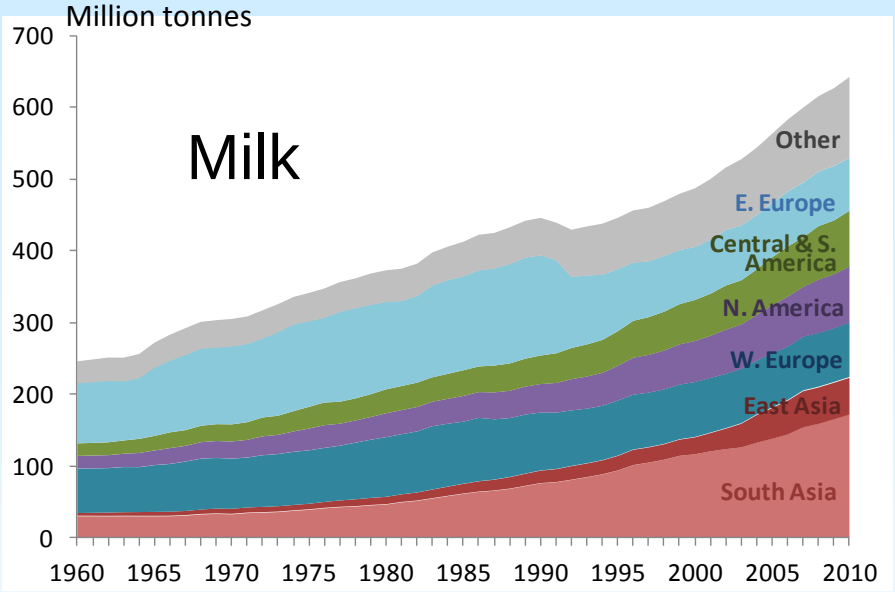
Achieving SLCP Emissions Reductions and Co-Benefits from Improved Manure Management in the Livestock Sector

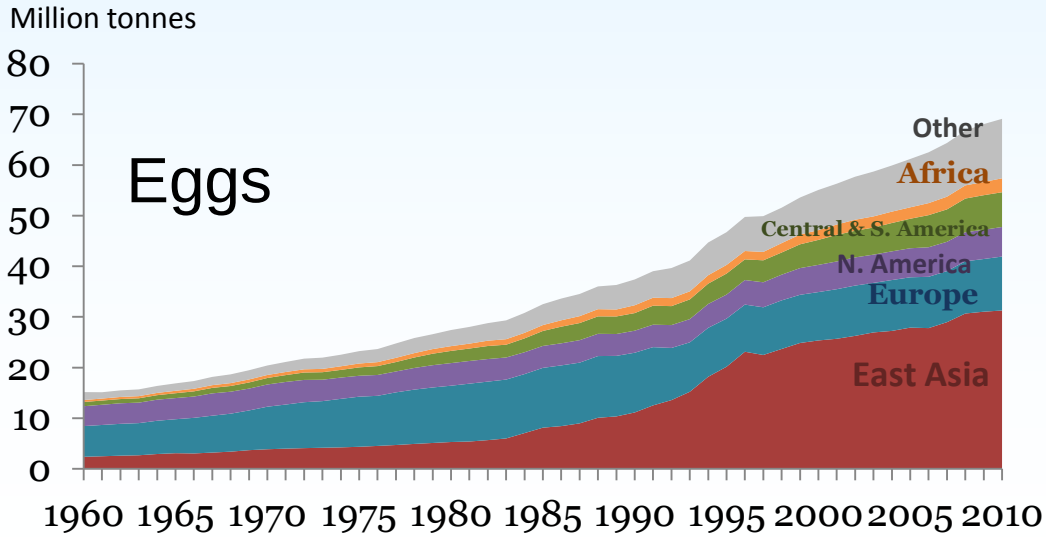
Improved storage of manure leads to:

- Improved air quality
- Improved resource use efficiency
- Reduced demands on finite sources (phosphate and fossil fuels)
- Reduced demand of fuel wood from forests
- Soil quality and water holding capacity
- Reduction of GHG nitrous oxide (N_2O)

Livestock sector trends: World production







Source: FAOSTAT

Technologies for good manure management practices are available, but implementation is a challenge:

- a lack of awareness of manure's potential;

- a lack of an enabling environment (service infrastructure, policy);

- inadequate spatial planning;

- dispersed expertise;

- a lack of resources to invest in effective manure management; and

- a lack of adequate demand and/or market signals to spur investment in effective manure management

Practice Change

Achieving SLCP Emissions Reductions and Co-Benefits from Improved Manure Management in the Livestock Sector

Objectives:

– Integrate manure management practices into livestock systems – reduce SLCPs (and other) emissions

– capture methane as an energy source, and

– optimize nutrient utilization for crop production

….. by managing and removing barriers to action with a view toward enhancing food security and sustainable development

Who is involved?

List of Partners: Bangladesh, Canada, Ghana, European Commission, United States; World Bank

Actors: The Food and Agriculture Organization of the United Nations (FAO); the Global Methane Initiative (GMI); the Global Research Alliance on Agricultural Greenhouse Gases (GRA); Wageningen UR Livestock Research (WUR); the International Livestock Research Institute (ILRI); the Livestock and Poultry Environmental Learning Center (LPELC); the Tropical Agrcultural Research and Higher Education Center (CATIE)

List of implementers: Wageningen UR Livestock Research (coordinating implementer); CATIE; SEI; ILRI; possibly FAO and/or LPELC

Expected Results (1)

- Raising awareness of manure management options at the level of policy, private sector and farmers organizations
- Advisory Board of leading international institutions to provide strategic guidance;
- Central Hub and three Regional Centers, working in close collaboration, to identify opportunities and conduct work in regions, build networks and partnerships, gather information, and implement projects;
- Exchange manure management information, connect people, and forge partnerships

Expected Results (2)

- Roster of experts to provide targeted technical assistance and training, analysis and practical implementation and policy support, relying heavily on co-financing and in-kind resources from partners;
- Launching projects and partnerships to improve manure management by providing information, experts, knowledge exchange, and access to resources;
- Establishing an internet-based information infrastructure to serve as a searchable repository for global and regional knowledge on manure management

Diversity

- Manure management practices vary widely according to geographic region, socioeconomic conditions, agricultural practices, and other factors.
- It is important to identify relevant policies and institutional arrangements that are needed in order to catalyse practice change

Resolution

For integrated manure management, there is…

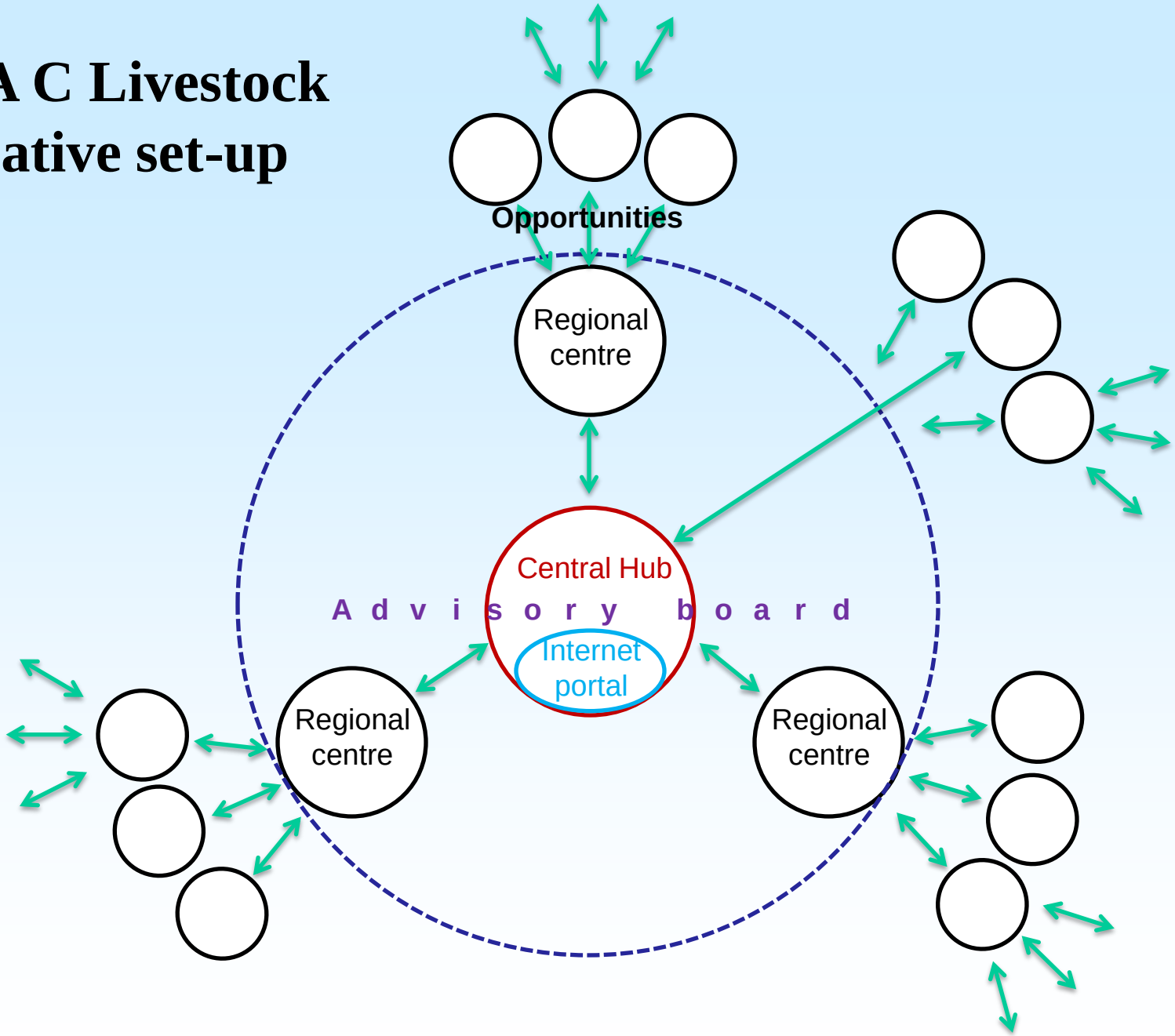
No single answer - diversity of contexts and systems

No single organization

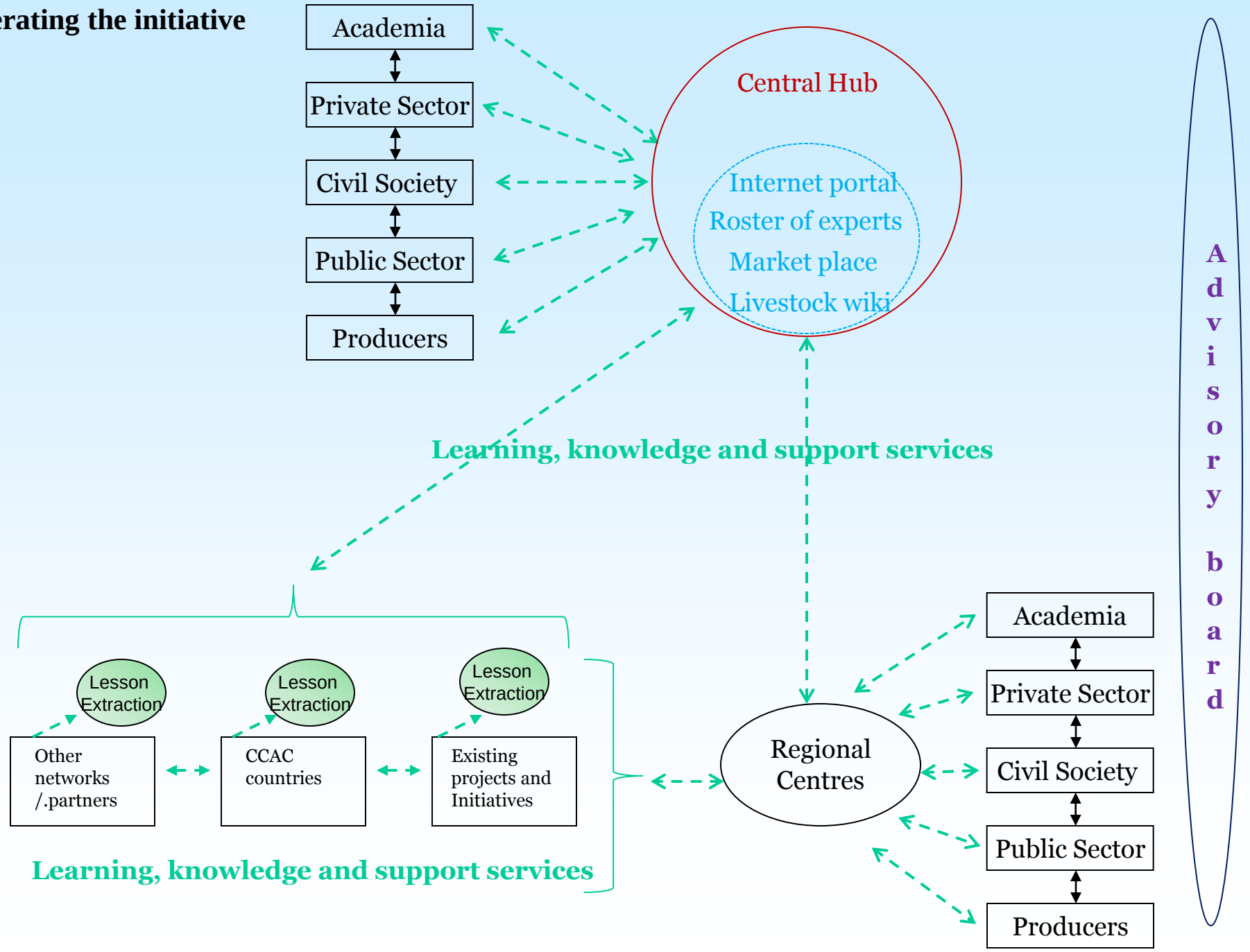
No single stakeholder group

Instead, there is a need for <u>collective, concerted and global action</u>

CCA C Livestock Initiative set-up



Operating the initiative



Potential linkages between CCAC Livestock Initiative and TFRN

- Link to experience and expertise on manure management under LRTAP
- Potential for LRTAP expert to sit on Advisory Board
- Opportunity for more LRTAP countries to join CCAC
- LRTAP to contribute to roster of experts
- Link to development of the GEF International Nitrogen Management System (INMS)

Acknowledgements:

The input of Theun Vellinga of Wageningen UR Livestock Research (WUR)

Thank you for your attention

More info


CCAC
CLIMATE AND CLEAN AIR COALITION
TO REDUCE SHORT-LIVED CLIMATE POLLUTANTS
www.unep.org/ccac
UNEP
About
Short-Lived Climate Pollutants
Actions
Partners
Related Efforts
Publications
News
Outreach
How to join
Login
The first global effort to treat short-lived climate pollutants – such as black carbon (or soot), methane and many hydrofluorocarbons (HFCs) – as an urgent and collective challenge.
The Climate and Clean Air Coalition to Reduce Short-Lived Climate Pollutants is catalyzing rapid reductions in these harmful pollutants to protect human health and the environment now and slow the rate of climate change within the first half of this century.
First Actions of the Coalition
Outreach
BRICKS MATTER
TO CLIMATE CHANGE AND HEALTH
BRICK PRODUCTION is warming up the planet
AIR POLLUTANTS
Short-Lived Climate Pollutants
CCAC at COP19 in Warsaw, Poland
Come join the CCAC at COP19 in Warsaw the 18th and 19th of November.
News
New Report Supports Need for Immediate Cuts in Short-Lived Climate Pollutants
Key Publications
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