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@MarkNitrogen

# Nitrogen International Policy Developments

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UK Centre for Ecology & Hydrology, Edinburgh

INI Virtual Event, 4 May 2020

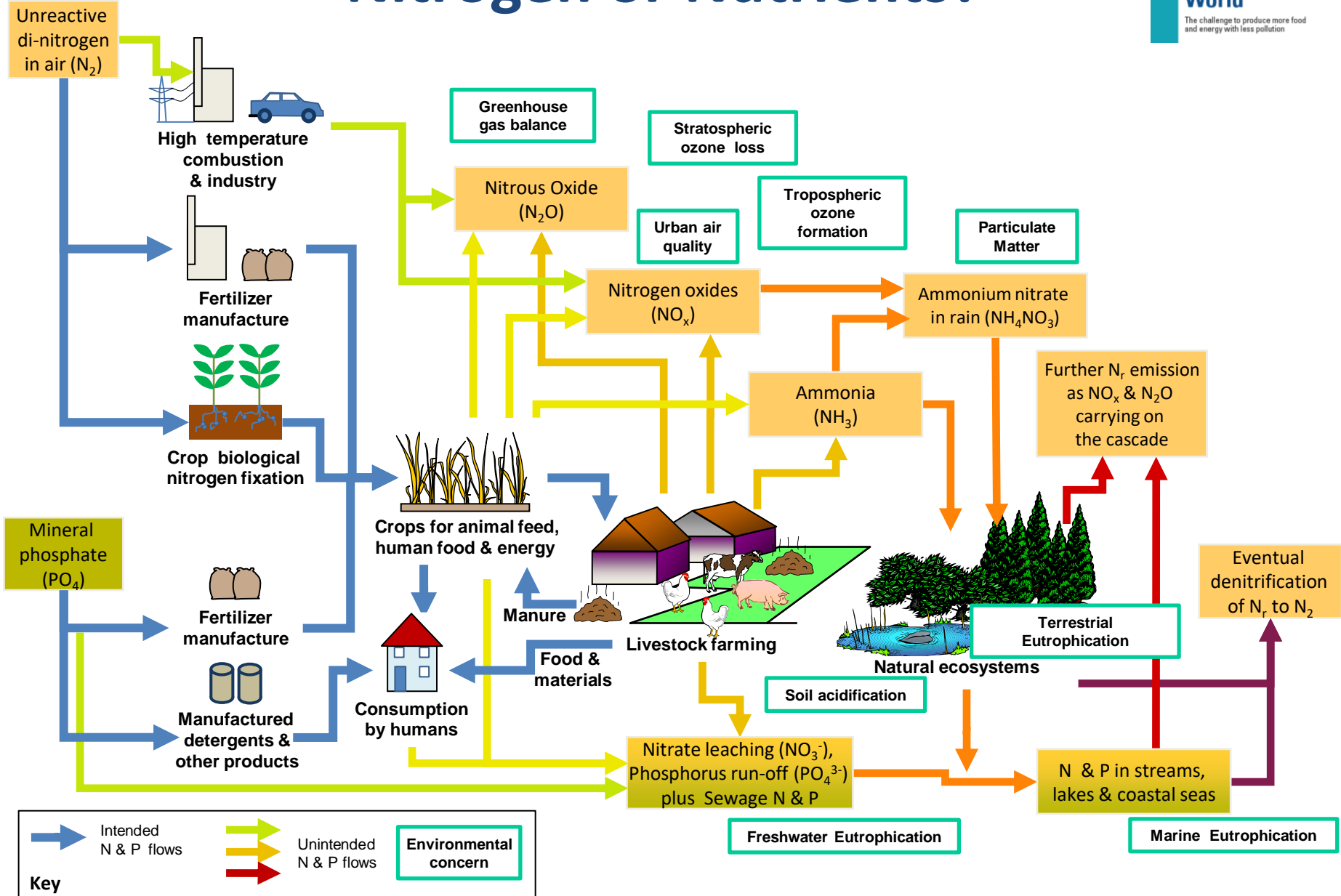


# Why nitrogen?

*“Nitrogen is not just another problem.*

*Rather it must be part of the solution if we are to make progress with so many of the problems we already know.”*

# Nitrogen or Nutrients?



# The five key threats of Nitrogen

The WAGES of imbalanced nitrogen

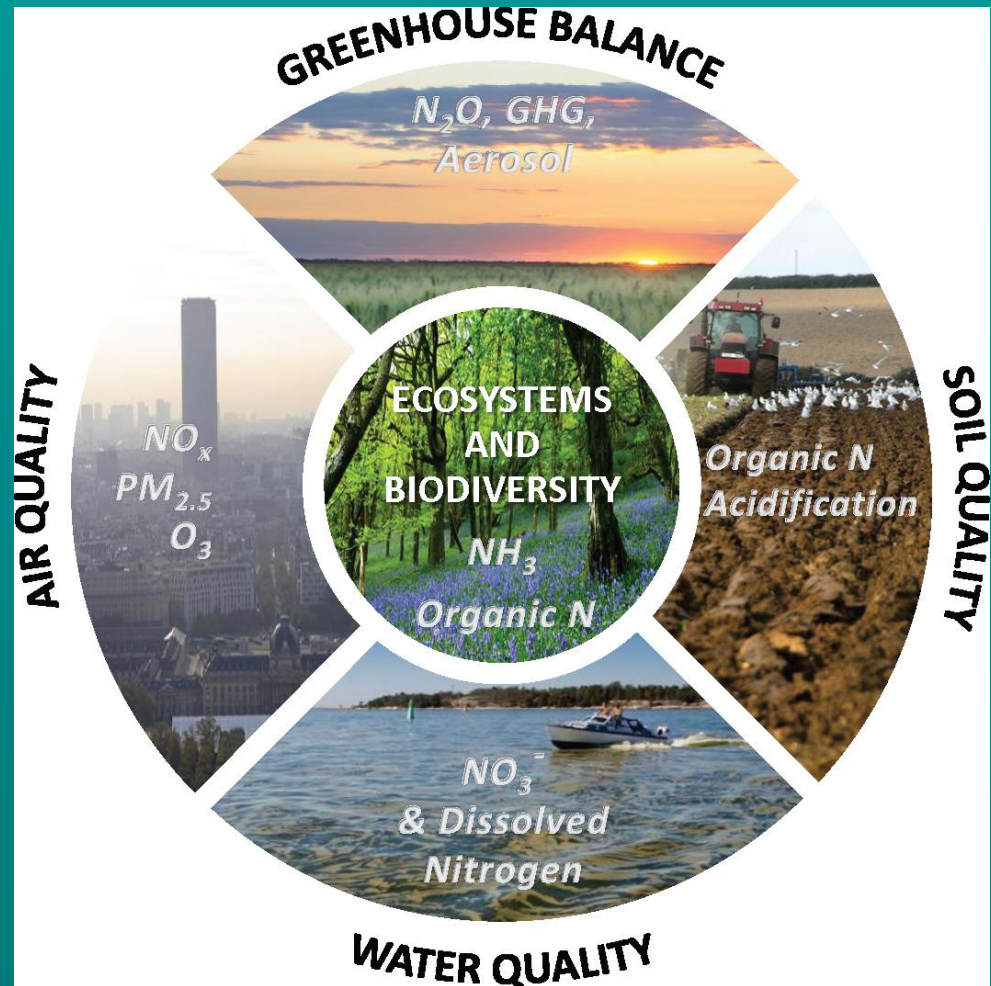
Water quality

Air quality

Greenhouse balance

Ecosystems

Soil quality





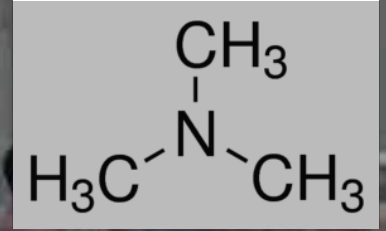
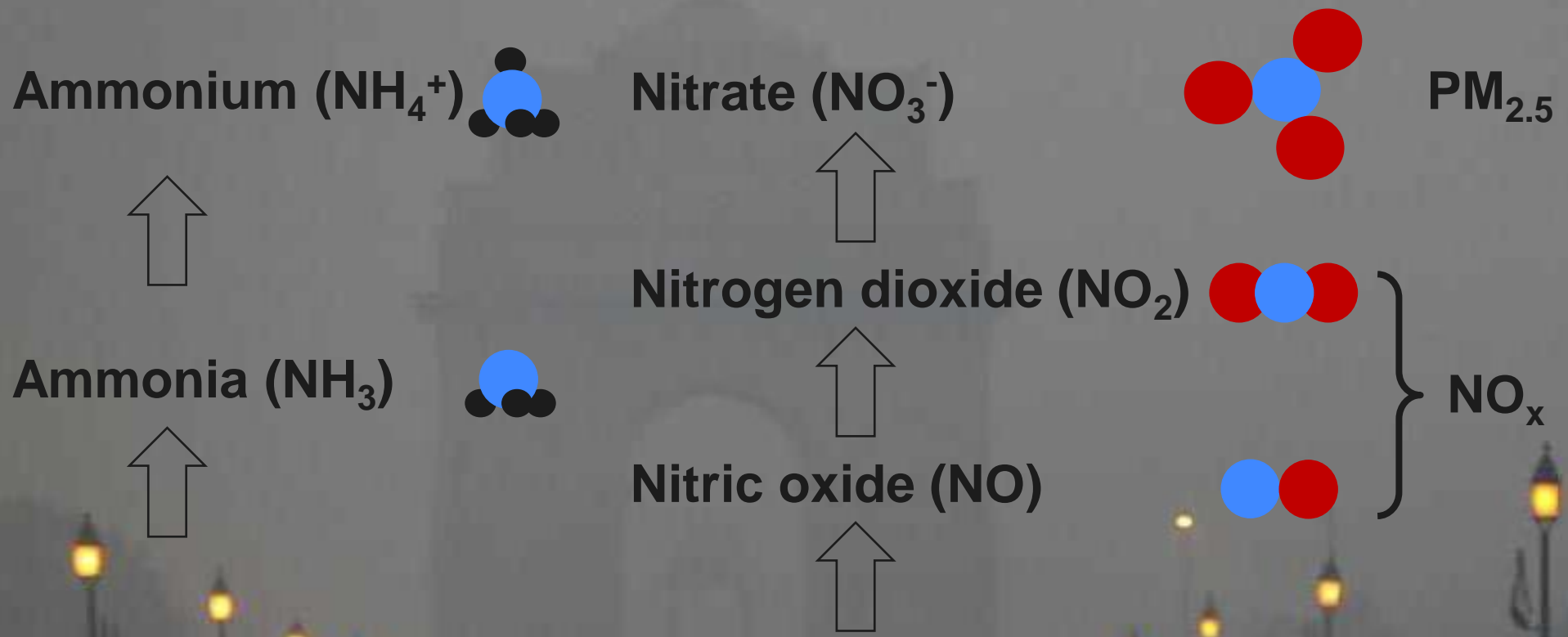
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@MarkNitrogen  
1 September 2019





- Health (Lung, Heart, COVID-19?)
- Visibility, Climate, Ecosystems, Economy etc.

# Nitrogen threat to vulnerable ecosystems



See article “The Trouble with Ammonia” and YouTube: “The CAFRE Ammonia Challenge”

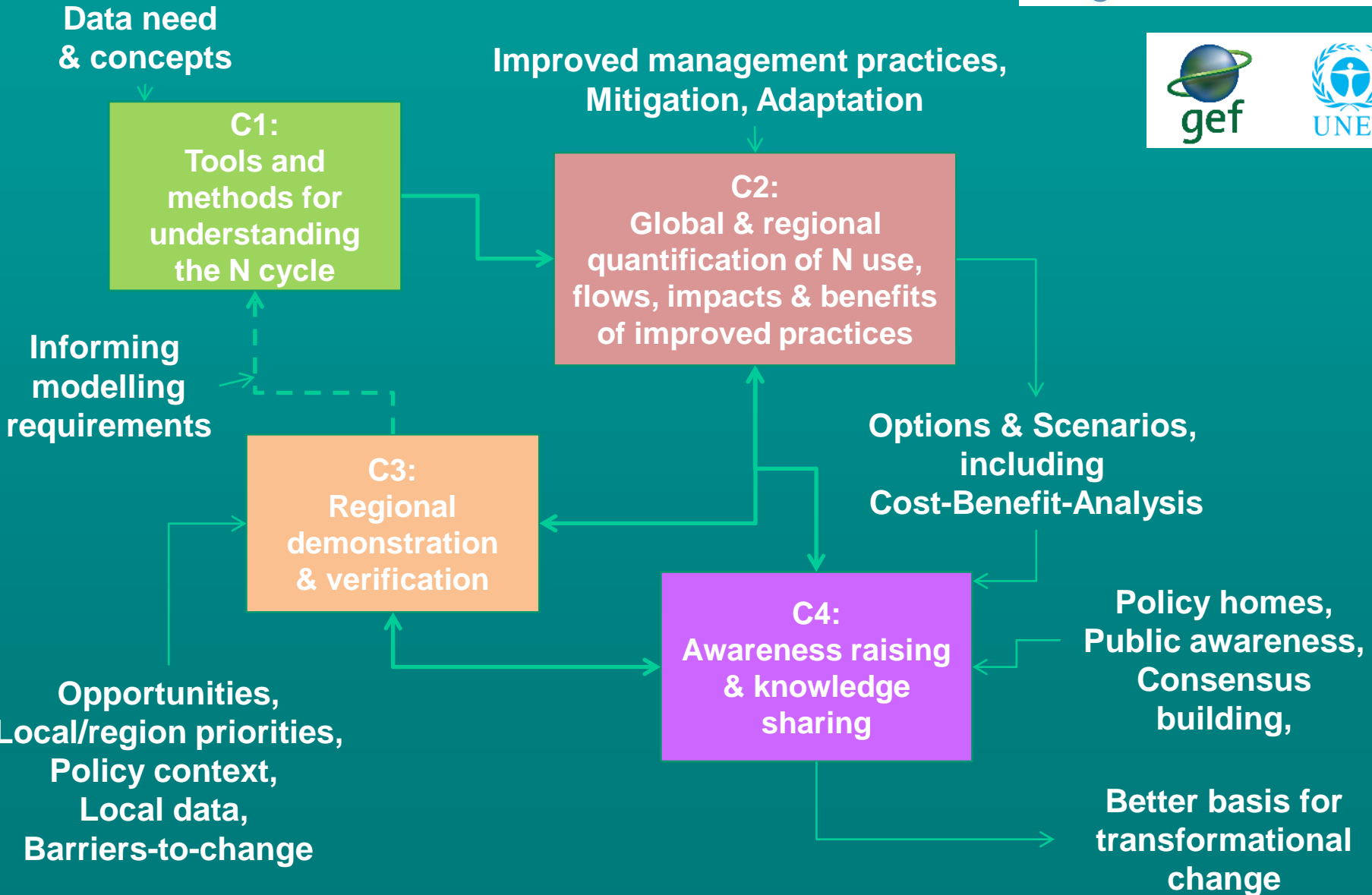


**#StikstofCrisis**

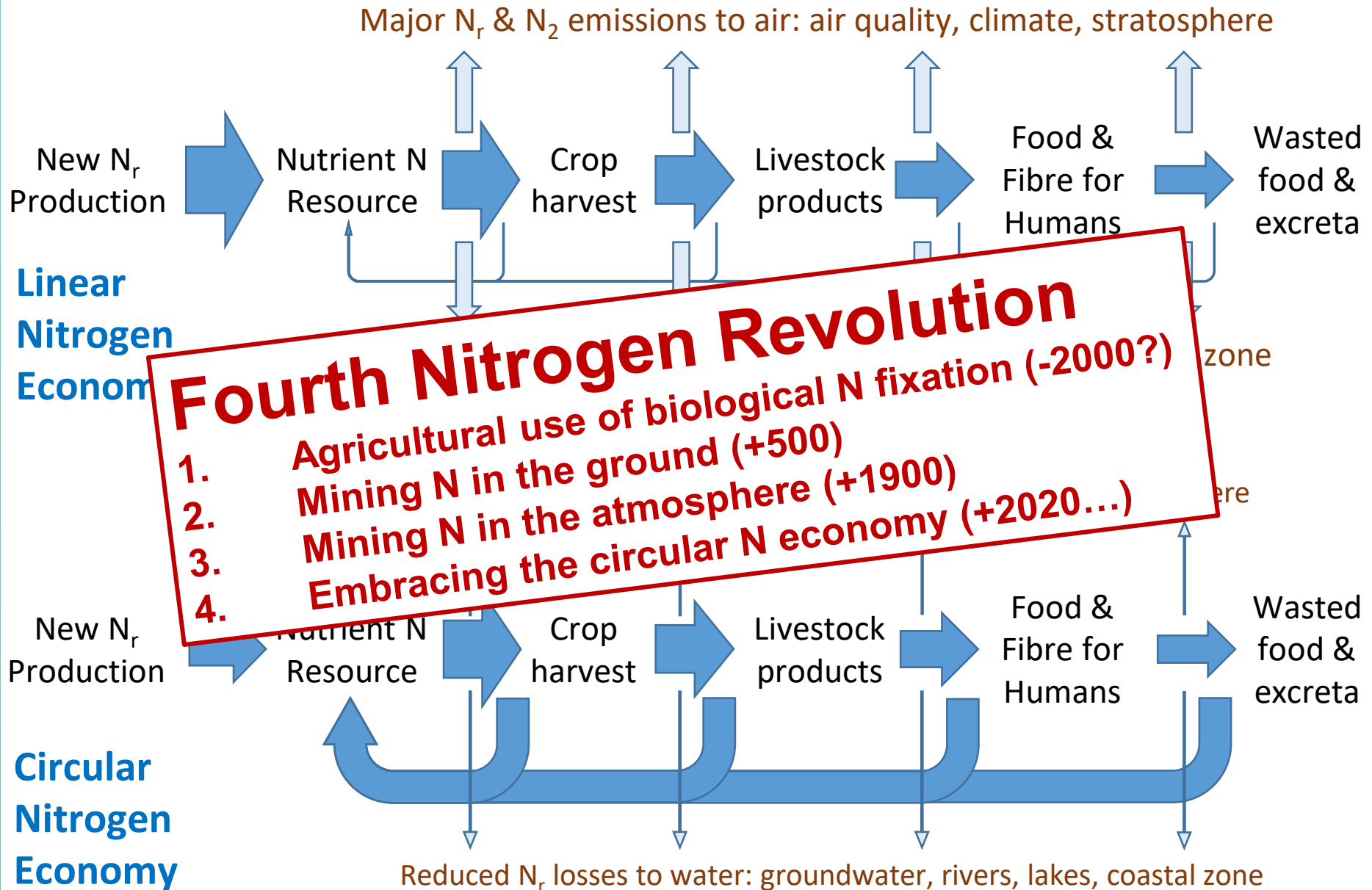
See: “A Tale of Two Tractors” (*Nourish Scotland*)



# INMS Approach



# Towards a Nitrogen Circular Economy



# Huge progress at the nitrogen science-policy interface

- International Nitrogen Management System established (2016)
- GCRF South Asian Nitrogen Hub established (March 2019)
  - Regional championship for global transformation
- Resolution 4/14 on Sustainable Nitrogen Management adopted at 4<sup>th</sup> UN Environment Assembly (March 2019)
- Launch of UN Nitrogen Campaign ‘Nitrogen for Life’ under lead of President of Sri Lanka (October 2019)
  - Colombo Declaration agrees to work on national roadmaps with “ambition to halve nitrogen waste by 2030”, preparing for UNEA-5
  - First Nitro-Innovation Exhibition
  - Premiere of the Nitrogen Song with Grammy<sup>®</sup> Award winner Ricky Kej
- First meeting of the Inter-convention Nitrogen Coordination Mechanism – INCOM (June 2020)

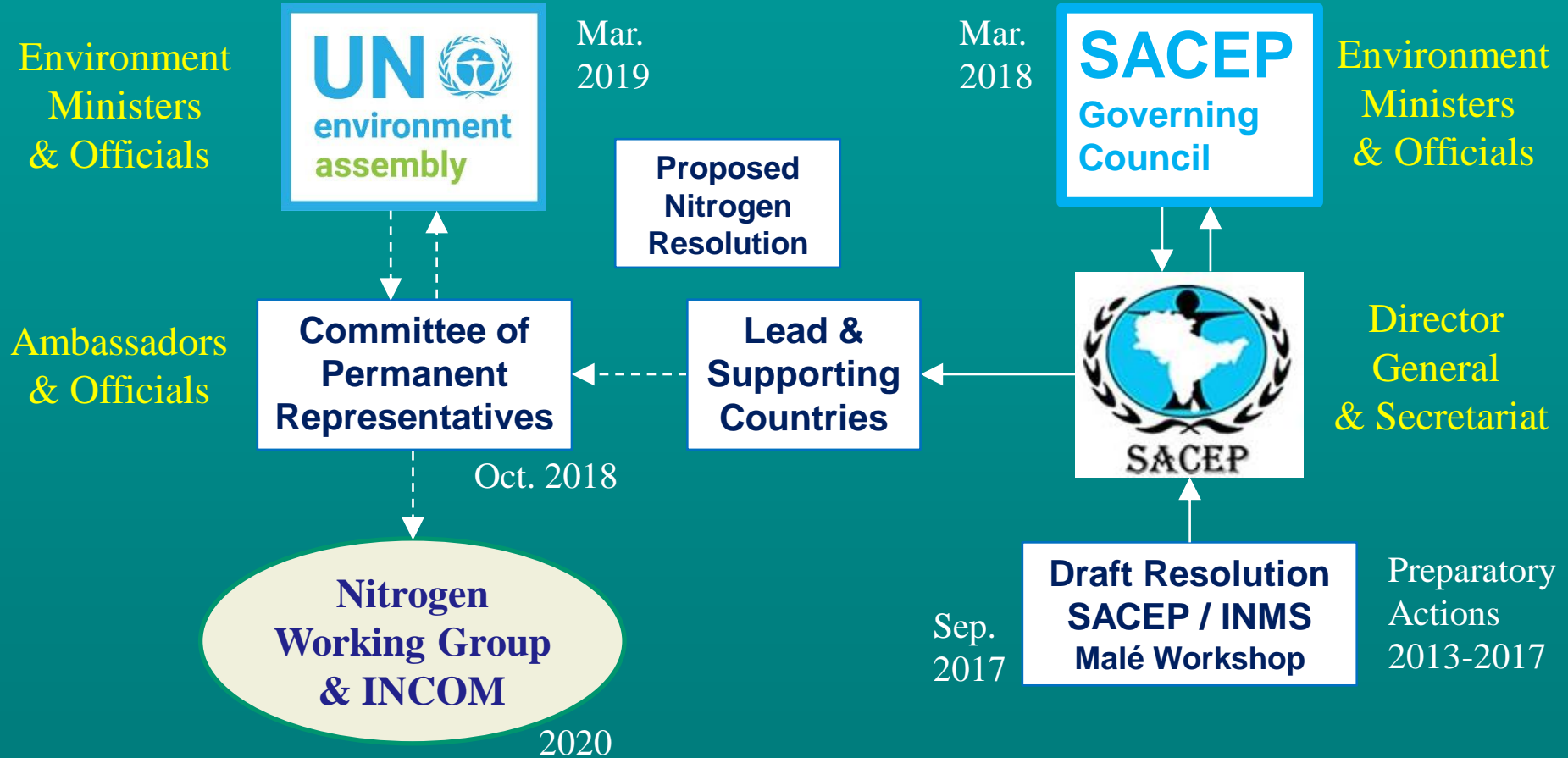


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# Nitrogen Champions

## Pathways from South Asia to the World





**United Nations  
Environment Assembly of the  
United Nations Environment  
Programme**

**Resolution  
UNEP/EA.4/L.16 agreed  
UNEP/EA.4/Res.14 final**

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**United Nations Environment Assembly of the  
United Nations Environment Programme  
Fourth session  
Nairobi, 11–15 March 2019**

**Sustainable nitrogen management\***

*The United Nations Environment Assembly,*

*Recognizing* the multiple pollution threats resulting from anthropogenic reactive nitrogen, with adverse effects on the terrestrial, freshwater and marine environments, contributing to air pollution and greenhouse gas emissions, while acknowledging the benefits of nitrogen use for food and energy production,

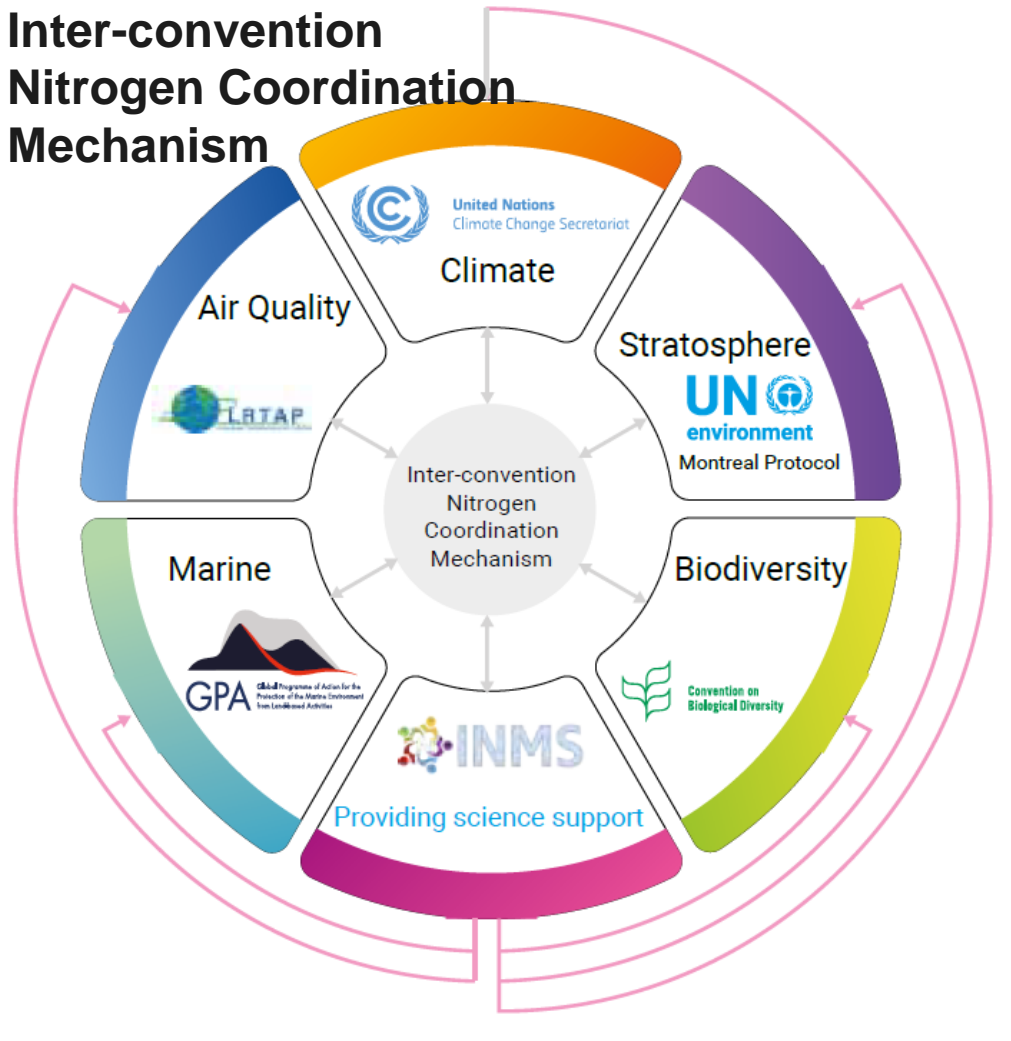
*Recognizing also* that global crop production in the world and the world's food security is dependent on nutrients, including nitrogen and phosphorus resource use,

*Calls on* the Executive Director of the United Nations Environment Programme to:

- (a) Consider the options to facilitate better coordination of policies across the global nitrogen cycle at the national, regional and global levels, including consideration of the case to establish an intergovernmental coordination mechanism on nitrogen policies, based primarily on existing networks and platforms and consider the case for developing an integrated nitrogen policy, which could enhance the gravity of common cause between multiple policy domains,

# Towards improved nitrogen science and policy coordination

## Inter-convention Nitrogen Coordination Mechanism



## Foreword



FRONTIERS 2018/19

Emerging Issues of Environmental Concern



**“Every year, an estimated US\$200 billion worth of reactive nitrogen is now lost into the environment, where it degrades our soils, pollutes our air and triggers the spread of “dead zones” in our waterways.”**

**UN** environment

Joyce Msuya  
Acting Executive Director  
United Nations Environment Programme

# Ten key actions for nitrogen management

## Agriculture

1. Improving nitrogen use efficiency in crop production
2. Improving nitrogen use efficiency in animal production
3. Increasing the fertilizer N equivalence value of animal manure

## Transport and Industry

4. Low-emission combustion and energy-efficient systems
5. NO<sub>x</sub> capture and utilization technology

## Waste water treatment

6. Improving food supply efficiency & reducing food waste
7. Recycling nitrogen (& phosphorus) from waste water systems

## Societal consumption patterns

8. Energy and transport saving
9. Lowering the human consumption of animal protein

## Spatial optimization

10. Spatial optimization and integration

# Is Biological Nitrogen Fixation the answer?

- BNF – a natural form of slow release fertilizer = expect smaller % N loss than with fertilizer
- Can BNF deliver enough N?
- Hot-moments of nitrate & other N losses from ploughed-in legumes?
- Brave new world: Nitrogen fixing GM wheat & rice?
- Most harvest goes to feed livestock, so still need better urine & dung management



**Farmer with his nursery for Azolla:  
a N-fixing floating fern**



# Everywhere & Invisible across the SDGs



INI commits to support  
a global goal to  
halve nitrogen waste.  
Bali, Oct 2018



# UN Campaign on Sustainable Nitrogen Management

23-24  
October  
2019



NITROGEN FOR LIFE

## Colombo Declaration

### on Sustainable Nitrogen Management

1. Endorse the proposed Roadmap for Action on Sustainable Nitrogen Management 2020-2022, including its activities as one of the instruments to establish an **Inter-convention Nitrogen Coordination Mechanism and secretariat to better facilitate communication and coherence across nitrogen policies, consistent with mandates of existing conventions and MEAs,**
2. Call upon UN agencies and other international organizations, development partners, philanthropic agencies, academic and civil society organizations, to support the implementation of this Declaration, through the establishment of mechanisms of cooperation to mobilize human, financial and technical resources, including capacity building and transfer of know-how and technology, for this purpose;
3. Agree that countries should consider, in line with their national circumstances and where relevant, to:
  - 3.1 Develop and implement comprehensive policies on Sustainable Nitrogen Management;
  - 3.2 **Develop national roadmaps for sustainable nitrogen management, with an ambition to halve nitrogen waste by 2030;**
  - 3.3 Conduct comprehensive assessments on quantitative and qualitative nitrogen cycling

**Global implication: halve nitrogen waste from all sources by 2030 to save \$100 billion annually.**

emphasizing the

# UNEP Committee of Permanent Representative Nitrogen Working Group

- Nitrogen WG to develop Terms of Reference for the **Interconvention Nitrogen Coordination Mechanism (INCOM)**
- First e-meeting 8-9 June (register through INMS)
  - Views from intergovernmental conventions & programmes
  - Views from UN Member States (National Focal Points)
  - Presentation of INMS & International Nitrogen Assessment for advice from Member States
  - Forward-look on emerging initiatives



# Next Steps to “Halve Nitrogen Waste”

- Pin-ball multiplier:  
UN Decade of Ecosystem Restoration  
“Halve nutrient pollution by 2040....”
- Equitable approach: more waste means more action needed
- Massive economic & environmental benefits for climate, air, water, health biodiversity etc.
- Business opportunities for circular economy (*30% of fertilizer made from recycled sources by 2030...?*)
- Action for UNEA-5... UNGA...



# The Nitrogen Bottom Line

- N affects water pollution, climate, air quality, biodiversity & ozone, relevant for multiple SDGs
- **Past fragmentation has limited progress:  
A joined-up perspective offers multiple win-wins**
- Measures require better use of fertilizers, urine, dung, with business opportunities from efficiency savings
- **Colombo Declaration (Oct 2019): ambition to halve nitrogen waste by 2030 and save \$100 billion annually.**
- Interconvention Nitrogen Co-Ordination Mechanism:  
INCOM to boost INCOME – *vital in a post-COVID world*

