Nitrogen and the Sustainable Development Goals

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Overview

- Very brief background to SDG’s
- Goals of relevance to the N Cascade
- Targets of relevance to the N Cascade
- Agreed indicators
- INMS and the SDGs
Sustainable Development Goals: Background

• 17 UN Sustainable Development Goals
• 169 targets
• Seek to build on the Millennium Development Goals and complete what these did not achieve
• The Goals and targets will stimulate action over the next fifteen years in areas of critical importance for humanity and the planet:
  • **People:** We are determined to end poverty and hunger, in all their forms and dimensions, and to ensure that all human beings can fulfil their potential in dignity and equality and in a **healthy environment.**
  • **Planet:** We are determined to protect the planet from degradation, including through **sustainable consumption and production,** **sustainably managing its natural resources** and taking urgent action on climate change, so that it can support the needs of the present and future generations.
  • **Prosperity, Peace, Partnership**
The 17 SDG’s
The 17 SDG’s
The N Cascade

- High temperature combustion & industry
- Fertilizer manufacture
- Crop biological nitrogen fixation
- Intended N flow
- Unintended N flows
- N2→N2→N2→N2
- Greenhouse gas balance
- Stratospheric ozone loss
- Urban air quality
- Tropospheric ozone formation
- Particulate Matter
- Nitrous Oxide (N2O)
- Nitrogen oxides (NOx)
- Ammonium nitrate in rain (NH4NO3)
- Ammonia (NH3)
- N in manure
- Livestock farming
- Natural ecosystems
- Leached Nitrate (NO3-)
- Freshwater Eutrophication
- Nitrates in streams, groundwater & coastal seas
- Marine Eutrophication
- Terrestrial Eutrophication
- Further emission of NOx & N2O carrying on the cascade
- Eventual denitrification to N2
N Cascade and SDG’s

- Obvious links between nitrogen and the two systems, but this can be further classified....
- More N needed
- Less N needed
- Improvements in N management, through education, access to N and technical knowledge, improving partnerships and communication
Lack of access:
Fertilisers
Organic N
Best practice information
Technology

More N/improved use needed
SDG’s – Less N/better use of N needed
## Clear SDG & Nitrogen Links

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<tr>
<th>SDG</th>
<th>Description</th>
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<td>2</td>
<td>By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, and that progressively improve land and soil quality.</td>
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<td>3</td>
<td>By 2030, substantially reduce the number of deaths and illnesses from air, water and soil pollution and contamination.</td>
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<td>6</td>
<td>By 2030, improve water quality by reducing pollution and by 2020 protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes.</td>
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<td>11</td>
<td>By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management.</td>
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<td>Implement the 10-year framework of programmes on sustainable consumption and production, all countries taking action, with developed countries taking the lead, taking into account the development and capabilities of developing countries.</td>
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<td>13</td>
<td>Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning.</td>
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<td>By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution.</td>
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<td>15</td>
<td>Take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and, by 2020, protect and prevent the extinction of threatened species.</td>
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Improvements in N management, through education, access to N and technical knowledge, improving partnerships and communication

SDG’s – driving improvements in N management
SDG’s and indicators

• Countries will be asked to report on their attainment of the SDG’s
• A number of ‘indicators’ to demonstrate achievement have been developed
• A nitrogen related indicator (e.g. Nitrogen Use Efficiency) was lobbied for, but ultimately not accepted
• There may be some scope for adding further indicators, but there is no clear path for this
• NUE may provide the opportunity to optimize the SDG’s for situations where N is in short and oversupply
Relevant indicators

- 2.4.1 Proportion of agricultural area under productive and sustainable agriculture
- 6.3.1 Proportion of wastewater safely treated
- 6.3.2 Proportion of bodies of water with good ambient water quality
- 11.6.2 Annual mean levels of fine particulate matter (e.g. PM2.5 and PM10) in cities (population weighted)
- 12.1.1 Number of countries with sustainable consumption and production (SCP) national action plans or SCP mainstreamed as a priority or a target into national policies
- 14.1.1 Index of coastal eutrophication and floating plastic debris density
- 14.2.1 Proportion of national exclusive economic zones managed using ecosystem-based approaches
- 15.1.2 Proportion of important sites for terrestrial and freshwater biodiversity that are covered by protected areas, by ecosystem type
- 15.9.1 Progress towards national targets established in accordance with Aichi Biodiversity Target 2 of the Strategic Plan for Biodiversity 2011-2020
2.4.1 Proportion of agricultural area under productive and sustainable agriculture

6.3.1 Proportion of wastewater safely treated

11.6.2 Annual mean levels of fine particulate matter (e.g. PM$_{2.5}$ and PM$_{10}$) in cities (population weighted)
2.4 By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems...

15.9 By 2020, integrate ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies and accounts.

14.1 By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution.
6.6 By 2020, **protect and restore water-related ecosystems**, including mountains, forests, wetlands, rivers, aquifers and lakes.

2.4 By 2030, ensure **sustainable food production systems** and implement resilient agricultural practices that **increase productivity** and production, that **help maintain ecosystems**, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality.

Consider targets – e.g. 2020, 2030

3.9 By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution....
Regional Demonstrations (too much N, too little N)

Regional and national N assessments

15.9 By 2020, integrate ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies and accounts

Field scale 20% NUE improvement

2.3 By 2030, double the agricultural productivity and incomes of small-scale food producers...

12.1.1 Number of countries with sustainable consumption and production (SCP) national action plans or SCP mainstreamed as a priority or a target into national policies
12.8 By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature.

13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning.

**Component 4**
Awareness raising and knowledge sharing

**Activity 4.1**
Establishment and operation of INMS communications hub

**Activity 4.2**
INMS training, diffusion & international relations, inc. N footprinting

**Activities 4.3-4.4**
Support to internat. policy frameworks & development of long-term strategy

**Activity 4.5**
Harmonization, publication & dissemin. of guidance docs. across components

**Activities 4.6-4.9**
Provision of support to IW-LEARN & engagement with GEF & STAP

Clear link to SDG process
Conclusions

- There are many potential links between N and SDG’s
- The link between N and the indicators for SDG’s is not as straightforward
- NUE could be a powerful linkage, but is not yet accepted
- INMS will include work relevant for both N and SDGs’
- National action plans in the demos will be key
- Further development of specific N related indicators, such as NUE will be needed
- Timely engagement with the relevant IGO’s could also play a part
- Awareness of how nitrogen could help support attainment of SDG’s is crucial at several levels
Developing Farm and National N budgets, Nitrogen Use Efficiency & other Indicators

Quantifying threats to air and water quality, climate change, biodiversity, fluxes, flows including setting regional priorities

Examining barriers to change

Data need & concepts

C1: Tools and methods for understanding the N cycle

C2: Global & regional quantification of N use, flows, impacts & benefits of improved practices

C3: Regional demonstration & verification

C4: Awareness raising & knowledge sharing

Improved management practices, Mitigation, Adaptation

Options & Scenarios, including Cost-Benefit-Analysis

INMS Communications Hub & Training Activities (Intergovernmental Organisations, national agencies, through to public)

Links to other Intergovernmental Processes

Integrating methods and practices, to address N, issues

Linking models

Scenario setting

Better basis for transformational change

Policy homes, Public awareness, Consensus building,

INMS Communications Hub & Training

Activities (Intergovernmental Organisations, national agencies, through to public)

Links to other Intergovernmental Processes

Targets of 20% improvement in nitrogen use efficiency, in selected field scale studies in developing regions

Inputs to regional and national assessments, through conducting N budgets and assessing priority areas for action

Informing modelling requirements

Opportunities, Local/region priorities, Policy context, Local data, Barriers-to-change

INMS

Sustainable Development Goals

GLOBAL GOAL 12: SUSTAINABLE CONSUMPTION AND PRODUCTION

GLOBAL GOAL 2: ZERO HUNGER

GLOBAL GOAL 11: SUSTAINABLE CITIES AND COMMUNITIES

GLOBAL GOAL 13: CLIMATE ACTION
Linking International Nitrogen Policy Frameworks

Air Quality: LRTAP + regional

Biodiversity: CBD

Marine: GPA + regional

Stratosphere: Montreal Protocol

Overarching Goals including
Economy Wide Nitrogen Use Efficiency
More food and energy with less pollution

Policy Arena for Nitrogen UNEA, OECD...

Climate: UNFCCC

INMS
International Nitrogen Management System
(Science Support Process linking threats & benefits)