INMS meeting on Activities 2.1 & 1.5
Global integrated N assessment modelling

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Report from workshop 22-23 June 2017, Wageningen

Global scale Nitrogen modelling in view of benefits and threats
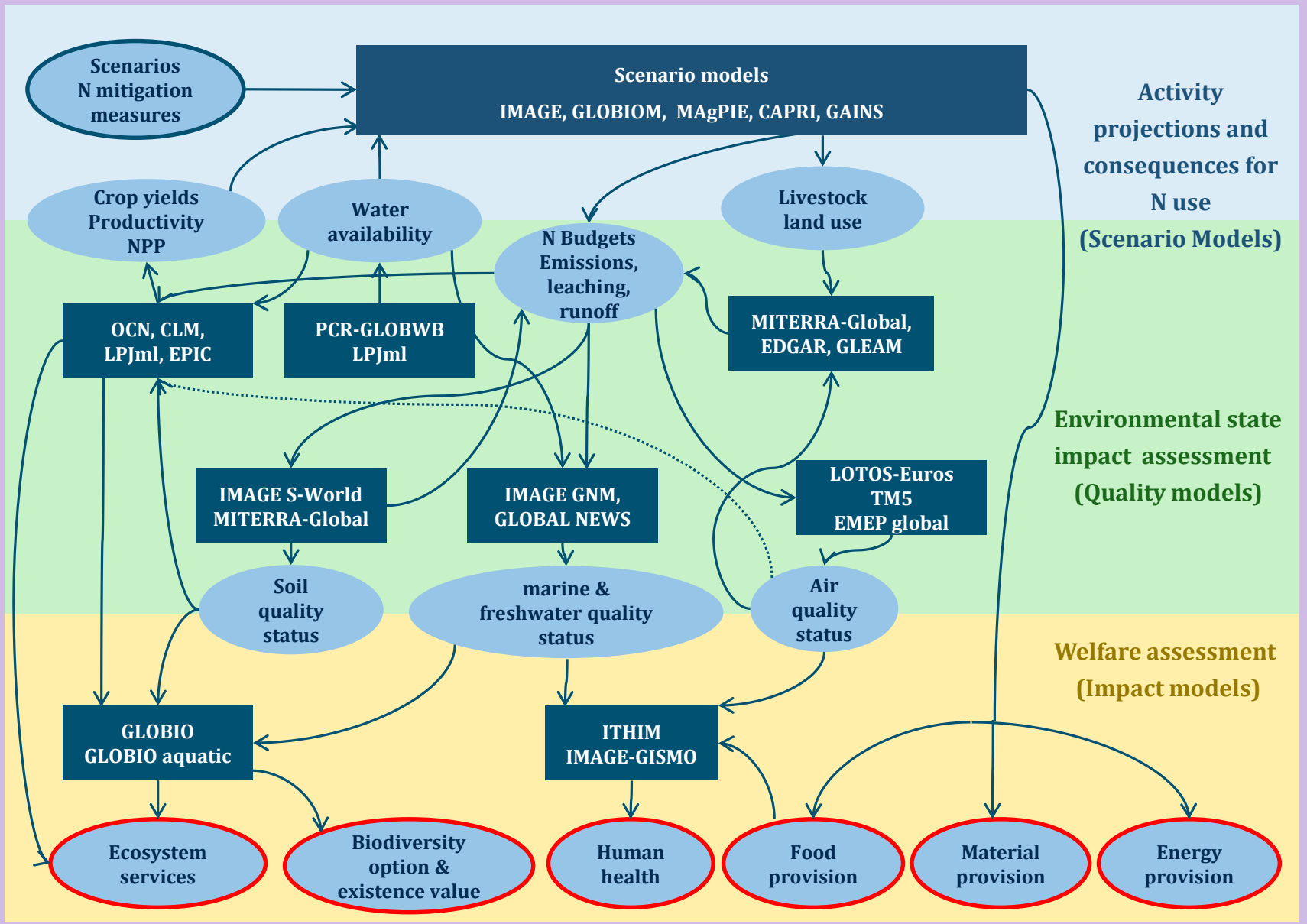
A global integrated N assessment model will be applied to quantify effects of N management on:

- food, feed, fiber and industrial production (benefits)

- quality of air, soil and water, and related human health, climate and biodiversity impacts (threats)

while

- being linked to socio-economic drivers (scenarios)

- accounting for variations in climate, soils, crops etc.

- including interactions of N cycling with other element cycles (macro- and micronutrients and water availability)

Multi model approach: potential models

Scenarios N mitigation measures

**Scenario models
IMAGE, GLOBIOM, MAgPIE, CAPRI, GAINS**

Activity projections and consequences for N use
(Scenario Models)

Crop yields Productivity NPP

Water availability

Livestock land use

N Budgets Emissions, leaching, runoff

OCN, CLM, LPJml, EPIC

PCR-GLOBWB LPJml

MITERRA-Global, EDGAR, GLEAM

Environmental state impact assessment
(Quality models)

IMAGE S-World MITERRA-Global

IMAGE GNM, GLOBAL NEWS

LOTOS-Euros TM5 EMEP global

Soil quality status

marine & freshwater quality status

Air quality status

Welfare assessment
(Impact models)

GLOBIO GLOBIO aquatic

ITHIM IMAGE-GISMO

Ecosystem services

Biodiversity option & existence value

Human health

Food provision

Material provision

Energy provision

Agreements, aims and intentions of a work plan for global scale modelling

Agreements

- We work on a coordinated work plan for three years with two phases of 18 months.

- Phase 1 will focus on outputs for the present (2005 base year) and future (2030, 2050 and possibly 2100) in response to a "business as usual (BAU)" scenario (SSP2 adapted to include N interventions; includes ongoing work at PBL and PIK).

- Phase 2 will focus on future outputs in response to various scenarios and N interventions, where interventions can be combined in storylines on the medium to long term (2030 and 2050) or evaluated separately on the medium term (2030).

Agreements, aims and intentions of a work plan for global scale modelling

Aims

- Include three scenario models (IMAGE, GLOBIOM, MAgPIE) that predict changes in N food chain, energy emissions, land cover, livestock and N inputs/N budgets at global scale

- Outputs of these models (three different results) will be used as inputs to global models for:

  - crop growth (e.g. LPJml being part of IMAGE and MAgPIE),

  - N emissions (e.g. MITERRA-Global),

  - air concentrations and deposition (e.g. TM5-FASST and others),

  - river export (e.g. Global NEWS, IMAGE-GNM)

  - aquatic eutrophication (e.g. IMAGE-GLOBIO-aquatic).

Agreements, aims and intentions of a work plan for global scale modelling

Intentions

- Outputs of atmospheric concentrations and deposition will be used as inputs to global models for

  - terrestrial productivity (e.g. LPJml),

  - terrestrial biodiversity (e.g. IMAGE-GLOBIO)

  - human health, depending on the submitted proposals by partners.

- Apart from global scale assessments, a regional scale focus is also foreseen linking models to INMS demonstration areas

Next actions

Specifically prepare INMS modelling links

- Request for bids (by June 30 – Wim de Vries and Wilfried Winiwarter)

- Return of bids (by July 21 – some leeway to holiday season - ALL)

- Selection of model chains to contribute under "Towards INMS" (by August 25 – "Towards INMS" Project Management Board based on suggestion by Wim de Vries and Wilfried Winiwarter