Component 2
Quantification of N flows, threats & benefits
De Vries / Ometto

Activity 2.1
Quantifying N flows, threats and benefits at global and regional scales
De Vries / Boyer (pending)

Activity 2.2
Preparation of global assessment of N fluxes, pathways & impacts
Sutton / Howard

Activity 2.3
Integrating methods, measures & good practices to address N_r issues
Oenema / Uwizeye (pending)

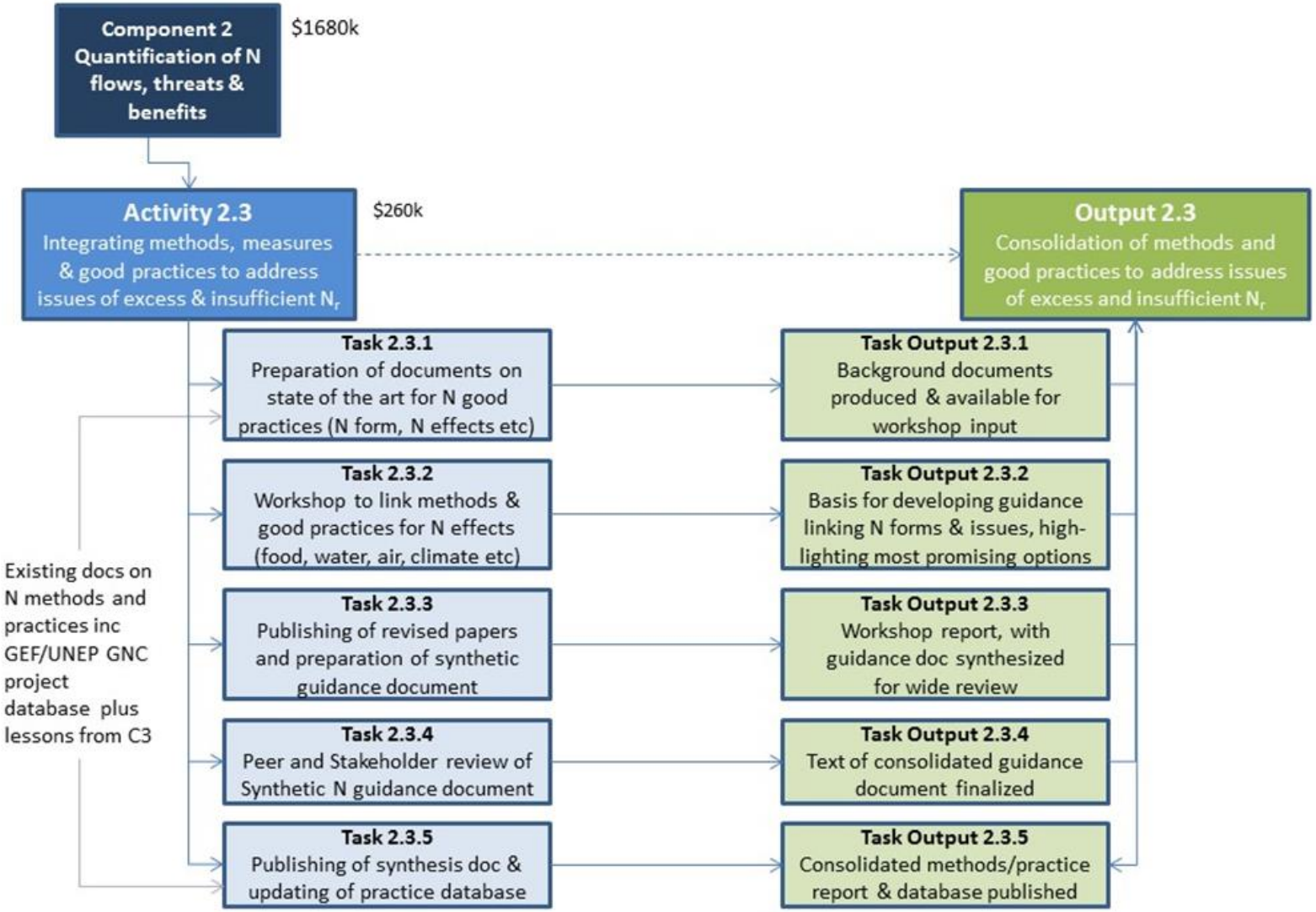
Activity 2.4
Future N storylines & scenarios with management/ mitigation options & CBA
Winiwarter / Kanter

Activity 2.5
Collation & synthesis of experience & measures adopted by GEF and others
Bleeker (pending)/Walker

INMS

Activities in Component 2

Overview A2.3



Update on A2.3

Integrating methods, measures & good practices to address Nr issues

- In Melbourne (02-12-2016) 1st explorative meeting; discussion items:
  - For whom do we write the Guidance document?
  - For whom is the Database?
  - Which sectors?
  - Who should be involved?
- Task and Activity lead agreements and amendments:
  - Oene Oenema & Will Brownlie (& FAO; pending)
- Budget agreements and suggested amendments
  - No budget arrangements made yet
- Workplan development – progress
  - We made a start with literature review and data-base development.
  - We have ideas to compact the work in shorter time
- Engagement with wider partnership
  - A number of planned workshops
  - No further plans yet.

A2.3 Background document BMPs (to be prepared)

- Overview of BMPs in the world:
  - To increase yield and quality
  - To reduce N losses to air and water

- Lessens to be learned

Example BMPs

1. Nitrogen (N) management;
2. Livestock feeding strategies;
3. Animal housing techniques;
4. Manure storage techniques;
5. Manure application techniques;
6. Fertilizer application techniques;

1. Closed periods for fertilization;
2. Minimal storage capacity;
3. No fertilization of steep slopes
4. No fertilization of wet frozen soil
5. Bufferstrips near water courses
6. Maximal 170 kg manure N/ha/yr
7. Uniform spreading of manure
8. Site-specific N application limits
9. Appropriate crop roations
10. Growth of cover crops
11. Establishment of fertilizer plans
12. Good irrigation practices

A2.3 Synthetic Guidance document of BMPs (to be prepared)

- Key principles of BMPs, e.g.
  - Region and farm specific
  - Scientifically sound and based on empirical evidence
  - Simple, feasible, applicable
  - Appealing, new generation of tools
  - Integrated

A2.3 Synthetic Guidance document of BMPs (to be prepared)

- Main systems to be distinguished.
  - Arable crops and horticulture
  - Permanent systems (orchards, vineyards)
  - Grassland-based dairy and beef systems
  - Mixed crop-livestock systems
  - Land-less animal production systems

- Socio-economic and pedo-climatic conditions

A2.3 Database of BMPs (to be prepared)

- Electronic database of BMPs.
  - Overview of BMPs
  - Search functions

A2.3 Deliverables

- Principles of overall Nitrogen Management
- Principles of BMPs
  - Arable crops and horticulture
  - Permanent systems (orchards, vineyards)
  - Grassland-based dairy and beef systems
  - Mixed crop-livestock systems
  - Land-less animal production systems
  - Industry
  - transport
- Electronic database of BMPs.
- Scientific review papers

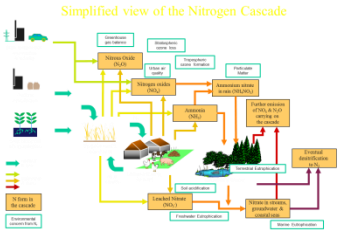
A2.3 Time schedule (approx.)

Activity	To be delivered
Background document	End of 2017
Release draft Database	End of 2018
First Workshop	1st half of 2018
Draft Synthetic Guidance Documents	End of 2018
Review Synthetic Guidance Documents	1st half 2019
Second Workshop	2nd half 2019
Release Synthetic Guidance Documents	2020
Release final Database	2020
Review papers	2018-2020

Links

- TFRN
  - EPMAN
  - EPNB
- EU Nitrogen Expert Panel
- .....

Overview of nitrogen cascade



Nitrogen Species

- NH_3
- NO_2
- NOx

Sector

- Farm (livestock)
- Farm (arable)
- Farm (mixed)
- Industry, Transport

Category

- Livestock feeding strategies,
- Animal Housing techniques,
- Manure storage techniques…..

Principle

- Decreasing surface area where emission take place
- Decreasing the time that emissions can take place
- Decreasing the source strength of the emitting surface

Region

- Latin America
- Africa
- East Asia
- South Asia

Measure

- Recycling the pH and temperature of manure
- Drying manure (especially poultry litter)
- Removing (scrubbing) NH3 from exhaust air
- Increasing grazing time

Output

Output…..*under development, could include*

- **General principles for abatement**
- **Scientific and technical background of techniques and strategies**
- **Economic cost of technique, euros per kg of N abated**
  - Cost for farmer
  - Benefits to the farmer
  - Capital and operational cost
  - Indication of cost in region/country
- **Interdependency of measures, potential co-benefits and pollution swapping**
- **Limitations and constraints of application of techniques**
  - identifying subsidies
  - region suitability of measure
- **Photograph of the measure being delivered**