Selection of regional demonstrations in 'Towards INMS' and proposal for discussion at the Lisbon Meeting (27-28 April 2015)

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Background and Status

This document refers to the 'Towards INMS' UNEP/GEF project for which the project concept has been approved and is now running under the Project Preparation Grant (PPG). The document describes criteria for selecting regional demonstrations in 'Towards INMS'.

This document should be read in conjunction with the *Briefing note on 'Towards INMS' and its Regional Demonstration activities*. It builds on the proposals for partner contributions as described in the *Project Identification Form (PIF)*. Both of these documents are available on the 'Towards INMS' website.

The present task is to work toward agreement on the selection of regional demonstrations areas, incorporating new information. Following preparatory discussions, short descriptions of the proposed 'Towards INMS' regional demonstrations will also be provided to support discussion in Lisbon and are available on the website.

The output of the present document is a proposal on selection criteria including: more than one country, feasibility, covering the different INMS Cases (1-4), representative and contributing to global critical mass, convincing partnership, partnership with an intergovernmental policy process, identification of key outcomes anticipated. Each of the proposed demonstrations is assessed in relation to these criteria with a proposal made for agreement on the selected demonstration regions.

Goal and outcomes of regional demonstration in 'Towards INMS'

The key purpose of the Towards INMS regional demonstrations is *to demonstrate how a cross-cutting approach that links different parts of the nitrogen cycle, including the benefits and threats, can deliver a stronger gravity for better management of these issues*. We could call it the 'nitrogen snowball' where joining up the snowflakes gives much bigger impact.

It should be remembered that Towards INMS is a 'targeted research project' rather than a classical demonstration project. In this context, the regional activity should therefore be seen as demonstrating the research approach and its benefits, showing how it can support international decision making at the regional scale, and how this can in turn support global progress.

The outcomes of the regional demonstrations should include:

a) quantification of the main nitrogen flows differentiated according to source sectors and key loss pathways,
b) better access to and understanding of data availability and limitations,
c) identification and quantification of the major source sectors and uncertainties,
d) highlighting and quantifying the different nitrogen benefits and threats in the region,
e) further examination of the biggest nitrogen threats and benefits in this region, (including where feasible cost-benefit analysis), including identification of priorities through engagement with policy and other stakeholders,
f) description in relation to nitrogen performance indicators (in cooperation with the global scale work),
g) review of available options for mitigation and better management of the nitrogen cycle, including identification of co-benefits and trade-offs. Development of a priority list of key options according to regional priorities,
h) profiling of current efforts, success stories, barriers to change and demonstration of how a joined up approach to nitrogen management may help overcome the barriers.
i) development of scenarios for future options in cooperation with the global analysis, but informed by the regional evidence.

The research activities of the Towards INMS team will require close liaison with policy audiences. For example, science can provide information on evidence of the main flows and opportunities for change, but it is a matter of policy to identify priorities. Similarly, while the science community can design scenarios, to be most effective, these will need to be developed considering a two-way interaction with the international policy community. In addition in order to incorporate information from the full range of experiences and to develop consensus on the opportunities for better nitrogen management and constraints, the process must engage with a wide range of other stakeholders including business and civil society.

These key elements can also be related to ideas expressed in the PIF (p 29):

> *"For each of the demonstration cases, a **common challenge** is identified in four parts, which then allows the **specific challenges** relevant for each region to be addressed:*
> - *To show how improved nitrogen use efficiency can contribute to improving food and energy security while reducing the multiple threats of nitrogen pollution (considering the full chain of nitrogen flow from all main sources and its components).*
> - *To quantify the multiple benefits of meeting the "20:20 goal for 2020" identified by Our Nutrient World (to improve NUE by 20% by 2020, saving 20 million tonnes of N globally).*
> - *To identify the main options (across N_r releasing sectors) specific to the region to meeting the 20:20 goal, and the main barriers to change.*
> - *To engage with a wide range of regional stakeholders in sharing tools, know-how and information about meeting the goals, including highlighting best practices (for sharing within the region and with other regions) and exchanging information on common barriers."*

Criteria for selection

Based on the PIF and subsequent discussions during 2014 and 2015, we list the following criteria for selection of the Towards INMS regional demonstrations:

1) The demonstration region should cover more than one country. This is necessary to address transboundary pollution issues, allow comparison of success stories and challenges between policy contexts, and address the barriers-to-change which are often international in nature.
2) The demonstration region should be feasible, bearing in mind the needs for cooperation, financing and datasets, while building synergies with other existing and planned activities. In particular it should build on other ongoing activities to be sure to maximize synergies.
3) Each of the four cases described in the PIF should be addressed:
   Case 1: Challenges and opportunities for developing areas with excess N_r.
   Case 2: Challenges and opportunities for developing areas with insufficient N_r.
   Case 3: Nitrogen challenges and opportunities for regions with transition economies.
   Case 4: Challenges and opportunities for developed areas with excess N_r. (This case can however only be included where national co-financing activities allow it, since the GEF finances are targeted at Cases 1, 2 and 3).
4) The group of case studies should be representative of the key nitrogen challenges faced by different regions across the globe (according to the four cases), and together contribute to the global critical mass to support two-way interaction with the global analysis.
5) The demonstration region should have a convincing science partnership in place, demonstrating readiness and capability to establish the demonstration, including appropriate co-financing.
6) The demonstration region should have a convincing partnership with at least one regional intergovernmental environment programme – ensuring a clear regional policy audience.
7) The demonstration partnership should be able to identify the key outcomes anticipated in terms of capacity building in nitrogen science and management and improved cooperation.

Regional demonstrations originally as noted in the PIF

According to the PIF document (p 30, originally drafted in 2012-2013) the following regional demonstrations were proposed. These form the starting point from which we aim to reach final agreement between the Executing Agency and Implementing Agency, based on discussions with a wide range of national, regional and global stakeholders during the PPG phase.

Case 1: Regions with excess reactive nitrogen loss. Original proposal: North China Plain - China; South Asia - India / Bangladesh.

Case 2: Regions with insufficient reactive nitrogen. Original proposal: Lake Victoria - Kenya / Uganda; Latin America (offer not yet received at that time).

Case 3: Regions with transition economies. Original proposal: East Baltic – Neva / Narva; Central Asia – Syr Darya; South East Europe, Black Sea – Dniester/Dnieper/Danube

Case 4: Developed countries with excess reactive nitrogen loss. Original proposal: Western Mediterranean – Tajo/Tagus.

While it is expected that this list will be modified as part of refining the project design, we also need to recognize that this network of partners is associated with significant co-financing to the overall project. Therefore, we should manage any amendments in relation to the need to maintain and build the project partnership and the catalytic role of GEF in drawing in co-financing commitments.

Subsequent discussion since the PIF document

Over two years have now passed since the PIF was drafted. This has allowed substantial additional discussion and refinement of what it means to establish a regional demonstration in 'Towards INMS'. Considering the criteria listed above, the following comments can be made for each of the four demonstration cases:

Case 1: Regions with excess reactive nitrogen loss

East Asia: A more international approach is now being developed, focused on the western pacific seaboard, with common problems of marine eutrophication and transboundary nitrogen air pollution, in addition, to national problems of nitrogen with freshwater quality and global contributions to greenhouse gas emissions. The currently developing proposal links China, Japan, South Korea and Philippines. Although the latter is geographically more separate, it is considered important to share lessons from the GEF Global Nutrient Cycles (GNC) project work on Manila Bay, while the Philippines also hosts the relevant intergovernmental body: PEMSEA (Partnerships in Environmental Management for the Seas of East Asia). The existing science partnership builds on the International Nitrogen Initiative (INI) Regional Centre for East Asia, with strong expertise in agronomy and environmental pollution. Marine links are being further developed, including through the LOICZ network. Further discussion is needed to agree the demonstration domain for data collection and analysis.

South Asia: Again a more international approach is now being developed, focused on linking the respective countries allowing information to be fed directly to the support the work of the South Asian Cooperative Environmental Programme (SACEP). Each of the main benefits and threats of nitrogen is considered relevant as a basis to inform the development of a more joined up approach to nitrogen management. The currently developing proposal links India, Bangladesh, Sri Lanka and Nepal. Depending on further discussions and co-financing opportunities, it may be possible to incorporate links with Pakistan and Myanmar. It will be useful to incorporate lessons from the GEF Global Nutrient Cycles (GNC) project work on Lake Chilika, however, the core focus of the present project is on the regional rather than the local scale. The existing science partnership builds on the INI Regional Centre for South Asia, with strong expertise in agronomy, plant and animal science and environmental pollution, including the coastal zone through links with the LOICZ network.

Case 2: Regions with insufficient reactive nitrogen

East Africa - Lake Victoria catchment: The Lake Victoria catchment links Kenya, Uganda, Tanzania, Burundi and Rwanda, which therefore all have a key interest in its good management. This demonstration builds on several previous GEF funded initiatives, while being unique in its scope to

link up nitrogen science and management across the nitrogen cycle. At present it is an open question to what extent waste water, agricultural nitrogen run off, air pollution (e.g. via biomass burning) and erosion problems contribute to the eutrophication problems of Lake Victoria. Strong agricultural experience under the lead of the INI Regional Centre for Africa will therefore be complemented by expertise in other disciplines, while the Lake Victoria Basin Commission represents the key intergovernmental framework, as a constituent body of the East African Community.

Latin America - La Plata River catchment: Discussions since submission of the PIF have identified the La Plata river catchment as a leading candidate for a Latin American INMS demonstration. In fact, this region contains both areas with too much and too little nitrogen, making it illustrative of the challenges of both Case 1 and Case 2. The La Plata is one of two major international river catchments in Latin America, the other being the Amazon. The La Plata is particularly of interest for INMS since, a) it includes a diversity of nitrogen source sectors, with each of crop agriculture, waste water, biomass burning, livestock rearing being important, b) it links directly to a relevant intergovernmental framework, Comisión intergubernamental de la Cuenca del Plata (CIC Plata) , c) it overlaps significantly with existing funded work including GEF IW and on the nitrogen cycle being coordinated through the Latin American Centre of the INI. By contrast, the River Amazon faces many other challenges, but does not offer this level of resource which is necessary demonstration for the nitrogen cycle.

Case 3: Regions with transition economies

East Europe - East Baltic: Neva / Narva: This demonstration offers a clustering between Russia, Estonia and Latvia, with relevance to link air pollution and water pollution challenges with those of greenhouse gas management while meeting food and feed security goals. This demonstration region builds directly on the Expert Panel on Nitrogen in EECCA countries (Eastern Europe, Caucasus and Central Asia), established within the Task Force on Reactive Nitrogen (TFRN), under the auspices of the UNECE Convention on Long-range Transboundary Air Pollution (LRTAP). Under this Convention the countries given a clear mandate and priority for TFRN to strengthen engagement with EECCA countries as a basis to support ratification of its protocols. This demonstration also offers the potential to develop cooperation with the Helsinki Commission (HELCOM) fostering knowledge sharing between air, freshwater and marine environments. However, since the PIF was developed, the EA understands that Russia is no longer eligible to lead a demonstration through GEF, which would effectively prevent execution of this demonstration area.

East Europe – Dnieper/Dniester/Danube: This demonstration offers a clustering between several EECCA countries, with the advantage of significant flexibility depending on the exact boundary to be agreed to the demonstration area. At present it is proposed to include the Dnieper and Dniester in full, and the immediately adjacent part of the Danube Basin (Siret). This would promote better nitrogen management between Ukraine, Moldova, Belarus, Russia and Romania, contributing substantially to the objectives of the LRTAP convention in relation to transboundary air pollution, as well as to the objectives of the Black Sea Commission and the Danube River Commission in regard of freshwater and marine objectives. Discussions are now being developed between the partners on how this demonstration can support essential regional cooperation while recognizing the current GEF funding rules. Development of the partnership is being developed under the lead of the UNECE

Task Force on Reactive Nitrogen, in cooperation with the European Centre of the INI. A key issue in this area has been the substantial reduction in fertilizer use and livestock numbers since 1989, which has lead to an improvement in water and air quality. As these transition economies seek to develop it remains an ongoing challenge to ensure that good nitrogen practices are adopted, that can help develop the green nitrogen economy while avoiding to jeopardize these environmental gains.

Central Asia - Syr Darya: This demonstration offers the potential to engage in an area which would benefit substantially by mutual cooperation and knowledge sharing. The selection was originally based on its simultaneous choice for assessment under the UNECE Transboundary Water Convention, on the Energy, Food, Water nexus. However, the INMS process has taken longer than expected, so that there would now be little concurrency with this process. Similarly, there is only limited partnership in this area at present with the INMS community. So far links are being developed through the TFRN EPN-EECCA of LRTAP and through the UNECE Water Convention. At present, it is concluded that there is insufficient capacity to conduct a INMS regional demonstration in this area. Instead, it is proposed to use Towards INMS as a framework for preparatory work that would allow a full nitrogen demonstration to be conducted in a future project.

Case 4: Developed countries with excess reactive nitrogen loss

Atlantic Seaboard – Tajo/Tagus: This demonstration was originally submitted to the PIF mainly by Spanish partners in cooperation with Portugal, fuced on the Tagus, in the hope that this could be a funded activity, which is especially relevant given the economic situation of these countries. However, it has since been made clear that, as part of the EU, this area would not be a priority for GEF funding for regional demonstration, which focuses on developing and transition economies. After the PIF was submitted another proposal has been put forward to build on actions of past EU funded projects. In particular, an offer has been made to include a demonstration focused on rivers flowing into the Atlantic (from the Pillars of Hercules to the English Channel: including parts of Spain, Portugal, France, England, Belgium). Although the GEF funds would not support this demonstration directly, the involvement of substantial added value would add to the critical mass of the INMS network. Key issues in this region include nitrogen management in the context of limited water availability and increasing livestock sector (Spain), while linking with air pollution and greenhouse gas goals. The point of engagement with this network is through the European Centre of the International Nitrogen Initiative.

Other Offers: Depending on the availability of funds from other, it may also be possible to associate other regional demonstration actions with INMS. For example, we have recently started discussion with Australian colleagues about Australasian demonstration activities in INMS. So far no offer of a regional study has been received from North America, though a study linking transboundary nitrogen issues would be welcome, e.g. between the United States, Canada and Greenland.

Review of the offers in relation to selection criteria

In the following table we briefly examine the developing demonstrations in relation to the selection criteria. This then forms a basis for proposal of the demonstrations to take forward in the Towards INMS project.

Criteria	East Asia [a]	South Asia [b]	East Africa (Lake Victoria catchment)[c]	Latin America (La Plata catchment)[d]	East Europe (East Baltic)[e]	E. Europe (Dnieper/ Dniester/ Siret)[f]	Central Asia (Syr Darya) [g]	W. Europe (Atlantic seaboard)[h]
1. More than one country.	Yes (3-4 countries)	Yes (4, potentially 6 if extra funding)	Yes (4 countries)	Yes (5 countries)	Yes (3-4)	Yes (5 countries)	Yes (4 countries)	Yes (5 countries)
2. Feasibility and building on existing Nr activities (cooperation, data, finance, synergies)	Yes	Yes	Yes	Yes	Builds on existing, but not currently feasible due to GEF finance rules.	Yes	No (not yet sufficient network)	Yes (subject to EU project resources)
3. Covers each of the Cases 1 to 4	Case 1	Case 1	Case 2	Mix of Case 1 & Case 2	Case 3	Case 3	Case 3	Case 4
4. Representative of key world regions & contributes to global critical mass	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
5. Convincing partnership with readiness for demonstration	Yes	Yes	Yes	Yes	Yes (but not finance)	Yes	Not yet (needs prior capacity building)	Yes
6. Partnership with intergovernmental framework	Yes, PEMSEA	Yes, LVBC	Yes, SACEP	Yes, CIC	Yes, LRTAP & HELCOM	Yes, LRTAP, Danube Commission (ICPDR)& Black Sea Commission	Yes, LRTAP and UNECE Water Convention	Yes, LRTAP, OSPAR, UNECE Water Convention
7. Identification of key outcomes anticipated by the regional demo partnership	Not yet tested	Not yet tested	Not yet tested	Not yet tested	Not yet tested	Not yet tested	Not yet tested	Not yet tested

Notes: a, China, Japan, South Korea, with involvement of the Philippines; b, India, Bangladesh, Sri Lanka, Nepal, and potentially (dependent on additional funds) Pakistan and Myanmar; c, Kenya, Uganda, Tanzania, Burundi, Rwanda; d, Brazil, Paraguay, Uruguay, Argentina, Bolivia; e, Russia, Estonia, Latvia, and potentially Finland; f, Ukraine, Moldova, Belarus, Russia and Romania (flexible, as more Danube could be included if additional funds); g, Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan; h, Spain, Portugal, France, UK, Belgium.

Proposal for agreement

Based on the above table Case 1 can be met by either by East Asia or South Asia or (partly) Latin America. Case 2 can be met by East Africa or (partly) by Latin America. Case 3 can be met by either the East Baltic, Dnieper/Dniester/Siret or Central Asia. However, the East Baltic is not feasible under present circumstances due to funding rules, while further capacity building would be needed in Central Asia before an INMS demonstration would be feasible.

Considering each of these with the need to generate global critical mass with each of the main regions covered (as requested by GEF), we arrive at the following proposal for the four cases identified:

Case 1: Regions with excess reactive nitrogen loss. Revised Proposal: **East Asia** (China, Japan, South Korea, including Philippines); **South Asia** (India, Bangladesh, Sri Lanka, Nepal, potentially including Pakistan and Myanmar if additional resources can be made available from other sources); **Latin America** – La Plata catchment (Brazil, Paraguay, Uruguay, Argentina, Bolivia)

Case 2: Regions with insufficient reactive nitrogen. Revised proposal: **East Africa** - Lake Victoria catchment (Kenya, Uganda, Tanzania, Burundi, Rwanda); **Latin America** is also relevant for this case.

Case 3: Regions with transition economies. Revised proposal: East Europe – Dnieper/Dniester/Siret (part of Danube) (Ukraine, Moldova, Belarus, Russia and Romania). While there is not yet sufficient foundation to conduct a Central Asia demonstration, it is proposed to include preparatory activities, as a basis to including a demonstration here in a future project.

Case 4: Developed countries with excess reactive nitrogen loss. Revised proposal: West Europe – Atlantic Coast (Spain, Portugal, France, UK, Belgium). This may be included to the extent that external funding sources are available. The inclusion of other areas, e.g. in North America and Australasia must be dependent on other funding opportunities.

Budgets and way of working

As specified in the PIF agreed with GEF and UNEP, 1,500,000 USD of GEF funding is allocated to the regional demonstrations. Given the importance of this work and the substantial associated co-financing that is offered in the PIF (c. 12,000,000 USD), it is proposed to increase this allocation by 10% , thereby transferring an additional 150,000 USD from Components 1, 2 and 4 to Component 3. This would give Component 3 a total allocation of GEF financing of 1,650,000 USD.

The proposed selection ensures that all four INMS Demonstration cases are addressed while noting that Case 4 can only be achieved through external financial support. This leaves the GEF finances focused on Case 1 (East Asia, South Asia and part of Latin America), Case 2 (East Africa, part of Latin America) and Case 3 (Eastern Europe). It is proposed that each region would be allocated resources equally at 270,000 USD of GEF contribution. If Latin America is considered to be 2/3 relevant for Case 1 and 1/3 relevant for Case 2, this gives the following breakdown: Case 1: 720,000 USD; Case 2: 360,000 USD; Case 3: 270,000 USD. This distribution ensures that it meets criteria four, of covering representative key world regions in order to contribute to global critical mass. Case 4 would be funded by external sources; involvement in the other components would support involvement in the INMS network. This leaves 300,000 USD for over-arching activities, harmonization and engagement across the regional demonstration activities.

It is noted that there are significant difference in salaries across the world, including between the regional demonstration areas. Discussions so far indicate that the prime requirements are a) establishing a regional coordination team (regional coordinator, principle investigators and project officer(s), the latter at post-doctoral level), b) significant travel budget to allow meetings and team working, c) a smaller budget for necessary bought in services, d) engagement with leading scientists

from other world regions to support sharing of expertise and tools. In order to maximize the support to the demonstration regions, it is proposed to cover d) under other components of the project.

With these details it is proposed that each regional centre would be indicatively supported by GEF funding as follows: a) 40% to support post-doc salaries (108,000 USD), b) 50% to support travel and meetings including preparing communications, reports and experiences (135,000 USD), c) 10% for additional bought-in services as necessary (e.g. to supplement key datasets, additional necessary information etc) (27,000 USD). It is proposed that the Executing Agency (EA) would establish a contract with each of the demonstration coordinators, who in turn would be responsible for managing and distributing the GEF funds within the regional demonstration partnership according to terms of the contractual agreement with the EA. This provides a basic model that may be tuned according to the specific needs of each region. Other associated costs such as publication costs of 'Towards INMS' reports would be handled in a harmonised fashion through the Executing Agency.

Implications for Co-financing

As noted above the selection of the regional demonstrations has implications for the expected co-financing comparable with that specified in the PIF. For example a larger number of demonstrations being included maximizes the opportunities for co-financing, similarly revisions that allow other partners to join the project may allow further co-financing. In addition, as the project gravity develops, significant new proposals linked to Towards INMS can be expected, which would add further additional co-financing to the critical mass. In this way, while some changes are expected (which may include an initial dip) we anticipate that in the long-term the co-financing contributions will at least meet or exceed the previous estimates.

Specific implications of changes proposed in this document in relation to co-financing are as follows:

a) It is here proposed that only one eastern European demonstration would be included as it is proposed that the GEF financing cannot cover the costs of the Baltic eastern European demonstration. However it is anticipated that most of the co-financing may be retained by increasing the focus of the eastern European partners on the Dnieper Dniester, Siret region.
b) By excluding the Baltic area from funded demonstration a lower co-financing from organizations specifically associated with the Baltic may be expected compared with the original PIF (estimate: 200,000 USD). It will be explored to see to what extent they can be included in other parts of the project.
c) By not including a funded Spanish demonstration a lower co-financing from Spanish organizations will be expected as compared with the PIF estimate (1,490,900 USD). We will explore the options to include key partners in other parts of the PIF, as well as further explore additional funding opportunities (e.g. through European Union sources).