



## 2021 World Environment Day Webinar

### *Sustainable Nitrogen Management for Ecosystem Restoration*

#### *Summary report*

Friday, 4 June 2021

Pakistan Time: 15:30-17:30 hrs | Kenya Time: 13:30-15:30 hrs



The **2021 World Environment Day (WED)** was hosted by **Pakistan** in collaboration with UN Environment Programme (UNEP) on the theme of “Ecosystem Restoration” with focus on resetting our relationship with nature. The WED-21 also marked the formal launch of UN Decade on Ecosystem Restoration 2021-2030, for protection and revival of ecosystems all around the world.



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A joint webinar, entitled ‘**Sustainable Nitrogen Management for Ecosystem Restoration**’ was organized by the Ministry of Climate Change, Government of Pakistan, UNEP’s Global Partnership on Nutrients Management (GPNM), SANH, INI, INMS, and UAF in conjunction with the 2021 World Environment Day celebrations, on 4 June 2021.

This webinar contributed to the UNEA-4 “Resolution on Sustainable Nitrogen Management” which recommends action on Nitrogen for protecting air and water quality, biodiversity, food sustainability and post-COVID economic recovery. Several member states have also associated themselves with the **Colombo Declaration**, with an ambition to ‘*halve nitrogen waste*’ by 2030.

2,133 individuals registered for the Webinar, of which 888 participated in the nearly 2-hour interactive webinar. The webinar included, amongst others, the pre-Launch of a book: “*Nitrogen Assessment; Pakistan as a case study; Nitrogen and Ecosystem Restoration: Catalysing change through the South Asian Nitrogen Hub; “Berlin Declaration on Nitrogen” - Key messages from INI 2021; Developing the Roadmap for Sustainable Nitrogen Management in South Asia; South Asia: a hotspot for Nitrogen pollution; and Nitrogen Management and Ecosystem Restoration – Examples of Mountain Ecosystems in North America*”

The webinar moderators were Tariq Aziz, from SANH, University of Agriculture, Faisalabad; M. Irfan Tariq, Director General, Ministry of Climate Change, Govt. of Pakistan; and Javed Akhtar Dean Faculty of Agriculture, University of Agriculture, Faisalabad, Pakistan, as well as Mahesh Pradhan and Milcah Ndegwa from UNEP. The opening session included a video recording from Joyce Msuya, Deputy Executive Director of UNEP. Expert presenters included Tariq Aziz, Lead SANH, University of Agriculture, Faisalabad, Pakistan; Mark Sutton, Professor, UK Centre for Ecology & Hydrology, Edinburgh; Stefanie Wolter, Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, Germany; M. Ashraf Haidari, Director General, South Asia Cooperative Environment Programme (SACEP), Colombo; Sri Lanka, N. Raghuram, Chair, International Nitrogen Initiative; Jill Baron, United States Geological Survey Natural Resource Ecology Laboratory, Colorado State University.



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## Opening

In her opening remarks (video recording), Joyce Msuya welcomed all participants to the World Environment Day webinar on Sustainable Nitrogen Management for Ecosystem Restoration.

She was excited to see momentum building on this important topic of sustainable nitrogen management,



as a follow up to the UNEA-4 Resolution on Sustainable Nitrogen Management. She referred to the Colombo Declaration on Sustainable Nitrogen Management, which has ambition to halve Nitrogen waste by 2030.

She also highlighted the launch of United Nation Decade of Restoration 2021-2030 which calls for protection and revival of ecosystem on the triple global challenge: Pollution, Biodiversity and Climate Change. Nutrients Losses are hard to see, and this is captured in Nitrogen Slogan – “Everywhere and Invisible”. She highlighted the UN Global Campaign on Sustainable Nitrogen Management as a platform to create awareness for policy makers and the public on the importance of Nutrients Use Efficiency, which is as important a challenge as biodiversity loss. To halve Nitrogen Waste by 2030, she highlighted several options, inter alia: Improve the performance of synthetic nitrogen fertilizers; Increase the use of organic fertilizers; Boost recycling of Nitrogen from agriculture; and Significantly reduce meat and dairy intake.



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**Pre-Launch of book: “Nitrogen Assessment; Pakistan as a case study”**

Tariq Aziz, from University of Agriculture, Faisalabad / Lead SANH Pakistan, gave a whole picture of nitrogen assessment in Pakistan. Pakistan is the 5<sup>th</sup> most vulnerable country to the Climate Change, which contributes < 1 % to the total global GHG emissions. Nitrogen use in Pakistan has been increased tremendously during last 6 decades, while N use efficiency has been decreased. The surplus N is causing poor air and water quality, loss in biodiversity, climate change and serious health issues.

Sustainable nitrogen use efficiency is linked to most of the SDGs hence a joint-up and holistic approach is needed to combat N challenge and ecosystem restoration. The team from UAF edited this book “Nitrogen Assessment; Pakistan as a Case Study”. The report covers Rethinking N use; plan to beyond than present; Nitrogen in relation to food security, human health, and economic stability; The available information on nitrogen status, sources, sinks and drivers of N use; Nitrogen use efficiencies in crops; issues and challenges; Nitrogen emissions and their impacts on ecosystem and health; and the available N measures/policies aiming at increased N use efficiencies in crop and livestock sectors.

The screenshot shows a webinar interface. On the left, a small video window displays Tariq Aziz. The main content area features a scenic background of a mountain valley with a river. Text on the slide reads: "Pre-Launch Nitrogen Assessment: Pakistan as a Case Study". Below this, it says "World Environment Day Webinar 2021" and identifies the speaker as "Tariq Aziz, University of Agriculture, Faisalabad, South Asia Nitrogen Hub". The bottom of the slide is filled with logos of participating organizations: Government of Punjab, UN Environment Programme, GPNM, INI, South Asia Nitrogen Hub, United Nations Convention on Ecosystem Restoration, World Environment Day, UN, and Pakistan 2021.



## Keynote Presentations

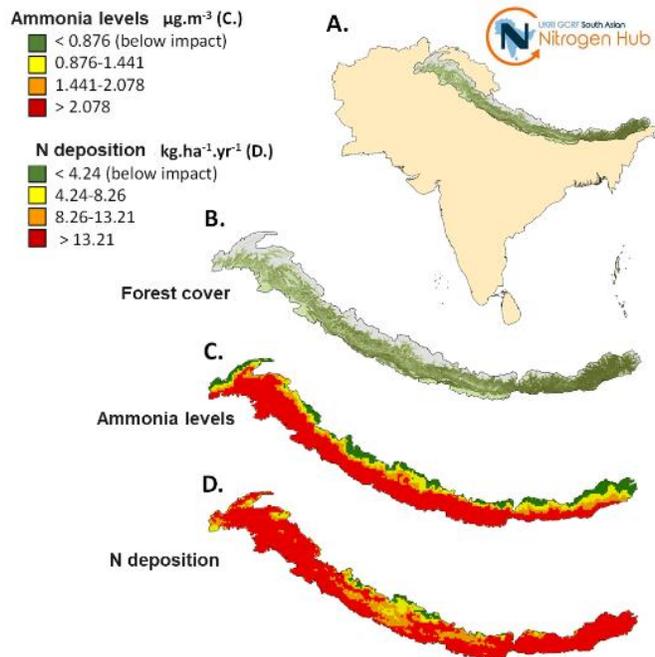
### *1: Introduction to the Nitrogen and Ecosystem Restoration– Catalyzing change through the South Asian Nitrogen Hub*

**Prof. Mark Sutton** showcased an ongoing study under the GCRF South Asian Nitrogen Hub on ‘Risk of nitrogen effects on sub-Himalayan forests’. Further, he explained that ecosystem restoration & nitrogen management go hand-in-hand.

Nitrogen brings issues together: ecosystem restoration, climate, air pollution, marine environment, health, economic recovery.

Nitrogen innovation for ecosystem restoration, climate & circular economy calls for a full lifecycle in:

- ✚ **Agriculture** - Less nitrogen waste means more available for food production, allowing inputs to be reduced
- ✚ **Industry** - Gaseous nitrogen recovery for cleaner air & circular economy
- ✚ **Wastewater** - Nutrient recovery & recycling for innovative products
- ✚ **Landscapes** - designed for C & N co-benefits (water, air, climate, nature, resilience...)
- ✚ **Reduced Food-Prints** - for healthy & sustainable diets



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## ***Part 2: Berlin Declaration on Sustainable Nitrogen Management for the SDGs***

### ***Key messages from INI 2021***

**Stefanie Wolter** from the Federal Government of Germany summarized the 4 key messages of the Berlin Declaration, which was adopted during the 8<sup>th</sup> Global Nitrogen Conference held virtually from 30th May - 4th June 2021:



1. Better manage humanity’s relationship with nitrogen. It is central to the success of the SDGs;
2. Support ambitious goals at national and international scales;
3. Integrate sustainable nitrogen management objectives within environmental policy efforts across all scales;
4. Use near-term opportunities to integrate sustainable nitrogen management within global policy efforts.

## ***Part 3: Developing the Roadmap for Sustainable Nitrogen Management in South Asia***

**Zammath Khaleel** from the South Asia Cooperative Environment Programme made a presentation on mapping South Asia’s actions to realize sustainable nitrogen management. He provided an update on the progress made by SACEP Member States to curb nitrogen pollution. He emphasized the importance of regional corporation for the sustainable nitrogen management. The roadmap for Sustainable Nitrogen Management is conducive for nations to realize the nitrogen management goals step by step.





**Part 4: South Asia: a hotspot for Nitrogen pollution**

**Prof. N. Raghuram** highlighted South Asia as a hotspot for NO<sub>x</sub>, nitrous oxide & ammonia emissions. He mentioned that Nitrogen is not only the new Carbon, but it was worse recently. In 2015 according to SANH- EDGAR data NO<sub>x</sub>, NH<sub>3</sub> and N<sub>2</sub>O grew above global mean in South Asia. He mentioned that farm soils are the main sources of nitrous oxide globally.

In order to address the challenges of N pollution, much global and regional efforts have been done to build a sustainable and environmental society, which included the science breakthrough of the Nr assessment in citizen science mode. He also pointed out that the Nitrogen pollution had been top 5 threats to our planet and raised people’s awareness to protect our ecosystem.

### Why N matters much more than C for healthy air

**Fossil fuel combustions in the transport, energy and industrial sectors**

High temperature combustion of coal, petroleum and natural gas releases a large amount of N<sub>2</sub> in the form of NO and NO<sub>x</sub>, collectively known as NO<sub>x</sub>.

The transport sector contributes to more than 65% of NO<sub>x</sub> emissions

Fossil fuel combustion is responsible for 13% of the anthropogenic fixation of N<sub>2</sub> to N<sub>2</sub>

Pollutant	Health Effect					Climate Change	
	Direct	Indirect	Acid rain	Eutrophication	Visibility	Direct	Indirect
CO <sub>2</sub>						X	
CO	X						X
HC	X	X					X
NOx	X	X	X	X	X	X	
PM	X				X	X	
SOx	X		X		X		X

**THE INVISIBLE KILLER**  
Air pollution may not always be visible, but it can be deadly.

**29%**  
OF DEATHS FROM LUNG CANCER

**24%**  
OF DEATHS FROM STROKE

**25%**  
OF DEATHS FROM HEART DISEASE

**43%**  
OF DEATHS FROM LUNG DISEASE

**BREATHE LIFE.** Clean Air. Healthy Future.

CO = carbon monoxide, HC = hydrocarbon, NOx = nitrogen oxides, PM = particulate matter, SO2 = sulfur oxide  
Source: CPCB, 2010



**Part 5: Nitrogen Management and Ecosystem Restoration – Examples of Mountain Ecosystems in North America**

**Prof. Jill Baron** illustrated how long-term ecological research in Rocky Mountain National Park on N-caused changes to ecosystems has been used to establish environmental policies designed to reduce N emissions. The strong scientific foundation, and support from non-governmental organizations provided valuable inputs to policy makers who were convinced to enact a program that will protect vulnerable ecosystems and their biodiversity. Importantly, by protecting the most sensitive environments, N management policies also protect human health through improving air and water quality.

Loch Vale Watershed  
Rocky Mountain National Park  
Long-term Ecological Research

USGS

Colorado State University  
Knowledge to Go Further



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## Discussions

**Question 1:** *Should one emphasize on N inputs looking on food production?*

**Answer:** Nitrogen losses are as a result of poor food production activities. There is need for Sustainable Nitrogen Management which yield in high food production

**Question 2:** *Can you share Berlin Declaration?*

**Answer:** The declaration is available at: <https://ini2021.com/berlin-declaration/>

**Question 3:** *Could you share the list of countries with highest fertilizer usage in South Asia?*

**Answer:** There is no fair comparison of countries usage of NPK fertilizer because of different policies and dynamics in each country. For example, Pakistan has Nitrogen deficiency in its soil while India has excess due to massive agricultural practices. On the other hand, Maldives, does not have large agricultural fields limiting their intense fertilizer usage.

**Question 4:** *Whether Nitrogen mutation is possible by modifying of plants?*

**Answer:** No - Nitrogen fixation is only possible in legumes and pulses. You either should rotate legumes or apply manure.

**Question 5:** *Is there a link between poultry and Nitrogen?*

**Answer:** Poultry droppings are a source of fertilizer and too rich in Nitrogen. Poultry waste should be properly stored and used as fertilizer. However, it's good to note some pollutants are Nitrogen put in wrong places.



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## Conclusion

The connection between the UN Decade for Ecosystem Restoration and Sustainable Nitrogen Management was highlighted. Nitrogen excess affects the entire ecosystem in many ways such as triggering freshwater and marine environment causing hypoxia leading to dead zones. There is need for building political momentum on Nutrients Use Efficiency (NUE) to achieve the UN Decade for Ecosystem Restoration and Sustainable Development Goals (SDGs) by 2030.

**Javed Akhtar** thanked all participants for their attendance, and special thanks to the webinar organizers. He mentioned that Nitrogen pollution is a serious threat to ecosystem restoration and wider environment. Further, mentioned that total use of N fertilizer is not very high, however due to low per hectare yield, the recovery of N is very low leading to high Nr emissions. Research is ongoing on N emission in Pakistan, hopefully to generate data on Nitrogen emission in Pakistan.

**Prof Dr Anas Sarwar Qureshi**, Vice Chancellor of University of Agriculture, said that humanity is facing an enormous challenge to secure adequate food production for the rising population, projected to reach 9.1 billion in 2050. He praised the government's 10 billion Tree Tsunami project and ecosystem restoration fund which was being appreciated by the global community. The World Environment Day celebration are actually our promise to the planet earth and every individual need to act accordingly and can play his/her role in ecosystem restoration, he further added. Considering the urgency of tackling the nitrogen pollution, we need to see a major upscaling of efforts from all walks of life, and across all sectors government, academia, policy makers, scientists, private sectors and society. He thanked all the panelists, UNEP, SANH, INI, GPNM and Ministry of Climate Change, Govt of Pakistan for this collaborative awareness seminar, in line with the World Environment Day 2021. He also thanked the participants for joining the webinar. He congratulated the whole team from UAF and UNEP for successful managing of the webinar.

**Further Information is accessible online:** [Webinar recording](#) [Webinar event page](#)



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