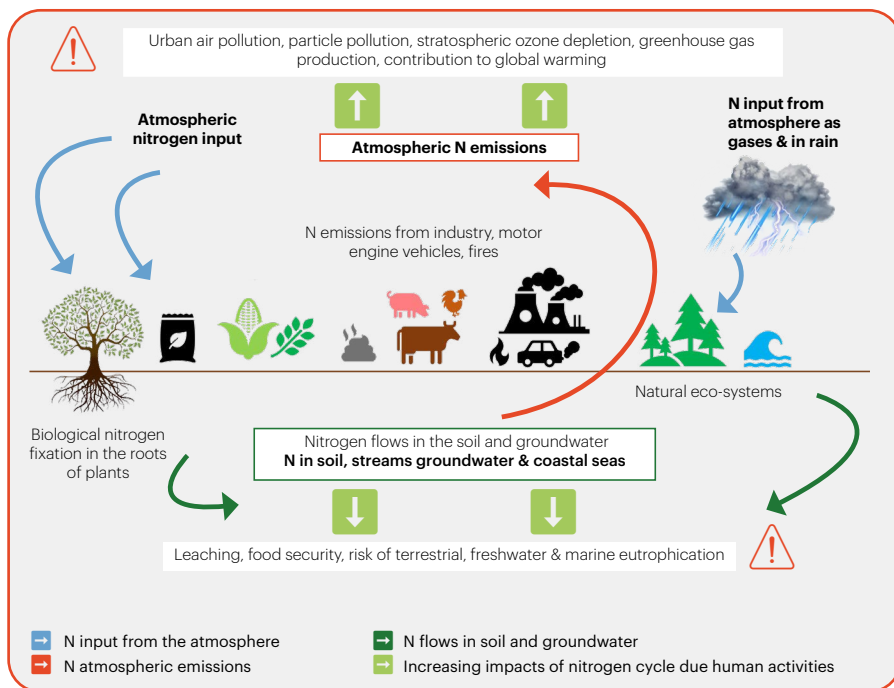


NITROGEN IN THE ENVIRONMENT: THE IMPORTANCE OF SCIENTIFIC MEDIATION TO RAISE AWARENESS AMONG STUDENTS AND TEACHERS



→ Nitrogen cycle

Nitrogen plays a crucial role in agriculture and the environment, but its impact can be problematic: excessive in urban areas and certain water bodies, and deficient in rural areas.

With its rapidly growing population, Africa faces environmental challenges related to inefficient nitrogen management.

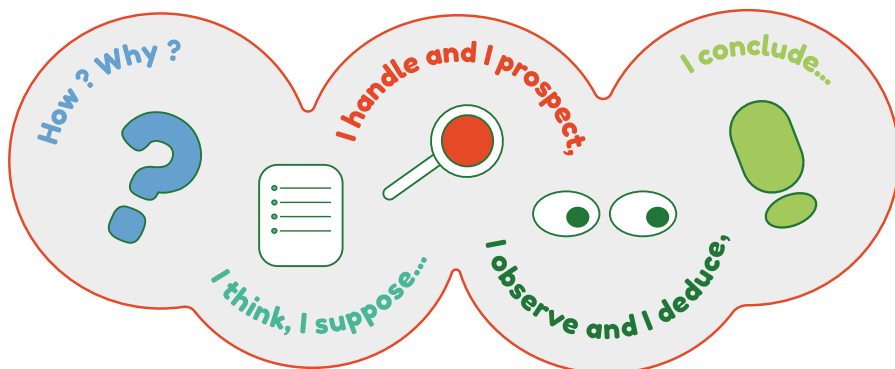
This text highlights the importance of raising awareness among future generations through scientific mediation, to better understand the consequences of nitrogen and possible solutions.

1. Mediation about Nitrogen: An Educational Tool for All

Nitrogen is a fundamental element, ubiquitous in the air, water, and soil, and essential for plant growth and the food chain. However, its environmental impacts are often ignored by the general public.

The INSA project, in collaboration with the association Les Petits Débrouillards Occitanie (APDOC), has implemented scientific mediation actions in Africa, in Côte d'Ivoire and Kenya, to raise awareness among students and citizens about the issues surrounding nitrogen.

The actions aim to raise awareness about the importance of nitrogen management through educational kits, available in both French and English, containing experimental interactive sessions on nitrogen cycles, agriculture, and its environmental impacts. These kits (for example, see the *Cover of Session 1*) are modular and adaptable to various educational contexts in Africa.



→ APDOC approach (<https://www.lespetitsdebrouillardsoccitanie.org/qui-sommes-nous/demarches-et-axes/demarche-scientifique/>)

Session 1

The nitrogen cycle in nature

- 1 – What plants need
[appendix A](#) [appendix B](#)
- 2 – The absorption of nutrients by plants
[appendix C](#) [appendix D](#)
- 3 – I am an atom, we are molecules
[appendix E](#) [appendix F](#)
- 4 – Proteins (optionnel)
[appendix G](#) [appendix H](#) [appendix I](#)
- 5 – The journey of an atom
[appendix J](#) [appendix K](#) [appendix L](#) [appendix M](#)
- 6 – Decomposition of organic waste
[appendix N](#) [appendix O](#) [appendix P](#)
Bacteria model

**The
nitrogen
paradox**



→ Cover of Session 1

2. Why Is the Nitrogen Paradox in Africa Important?

Nitrogen is crucial for agriculture, but its use often leads to **negative consequences** (climate change, biodiversity loss, air and water pollution). In developing countries, particularly **in Africa, fertilizer use is expected to rise**, potentially creating the same problems as in developed countries (environmental damage caused by nitrogen loss to the environment).

Currently, Africa suffers both from excess nitrogen (e.g., Lake Victoria with the proliferation of water hyacinths) and from nitrogen deficiency due to logistical and financial difficulties in accessing fertilizers: this is **the nitrogen paradox**. In Africa, agricultural yields remain low, and malnutrition persists, despite efforts to increase fertilizer use (Abuja Declaration 2006).

To address these challenges, it is crucial to implement **sustainable agriculture** and avoid overuse of fertilizers while **increasing yields without exacerbating nitrogen losses**.



→ The Nitrogen paradox

3. The Importance of Scientific Mediation



→ Scientific mediation in a school in Kenya

In Africa, there is an urgent need to introduce the population, particularly young people, to scientific mediation activities. This would foster the **development of scientific reasoning skills** and encourage young people to engage in scientific studies, thus contributing to the resolution of environmental and social challenges.

Through actions like those carried out by APDOC, younger generations can develop critical thinking skills and make informed decisions, supporting the United Nations Sustainable Development Goals (SDGs) and promoting a scientific culture accessible to all. Such initiatives **encourage curiosity and active participation, promote inclusion, and help fight educative, social and territorial inequalities**, particularly in Africa.

Conclusion

Scientific mediation, especially on environmental topics like nitrogen, is a key tool to raise awareness among young generations and educators in Africa. The INSA project and the free educational tools developed by APDOC contribute to a better understanding of nitrogen-related issues and help disseminate sustainable practices to **address agricultural and environmental challenges**.

Through an inclusive and participatory approach, scientific mediation can transform behaviours and promote solutions for a more sustainable future.



The project is funded by the MSCA-RISE action under the European Union's Horizon 2020 research & innovation program, grant agreement n° 871944.