**Challenges to improve nutrient use efficiency for optimum food supply while reducing environmental pollution.**

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The recent European Nitrogen Assessment (ENA) has highlighted the importance of nitrogen pollution, linking key threats for water quality, air quality, greenhouse gas balance, ecosystems and biodiversity, and soil quality. Together these threats are estimated to contribute a social impact valued at 70 to 320 billion Euro per year across the European Union.

These findings set a major challenge to find ways to reduce these adverse impacts. The ENA addressed this through a package of key actions, which is now being refined in cooperation between the International Nitrogen Initiative (INI), UNEP and the Global Partnership on Nutrient Management (GPNM). Among 9 key actions, the foundation must be improvement of nitrogen use efficiency in crop and livestock agriculture, including the more efficient use of fertilizers, manures and other recycled nutrient sources. Precision agriculture has a key role to play, and it is vital that this addresses both arable and livestock sectors, simultaneously reducing pollutant emissions.

These developments must be linked to the need for behavioural change among EU citizens, given that a key determinant of future food security is the extent to which we consume animal products. The ENA showed that most harvested N in Europe feeds livestock rather than people, decreasing nutrient use efficiency. At the same time, many European citizens currently enjoy "food luxurity" (the security of our food luxury), consuming more animal products than is needed for a healthy diet. As developing countries increasingly adopt western dietary patterns, there is a major challenge to integrate both technical efficiency and consumption-choice issues into the food security debate.

Several of these issues are being further investigated by the International Nitrogen Initiative, including copperation with the EU FP7 project ÉCLAIRE: “Effects of Climate change on Air pollution Impacts and Response strategies for European ecosystems”. ÉCLAIRE points to the risk that ongoing climate change may increase pollutant emissions in the long term, highlighting the need for early mitigation actions to avoid the worst effects.