A new approach to nutrient pollution governance in France and the EU

David Kanter

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David R. Kanter*

david.kanter@nyu.edu
Associate Professor of Environmental Studies at New York University, Chair of the International Nitrogen Initiative and former LIEPP Visiting Professor (July 2022)

ABSTRACT

Nutrient pollution is a major environmental threat, fueled by synthetic fertilizer and manure use. However, the narrow focus of most policy on changing farmer behavior ignores the underlying forces that constrain their behavior. The "Governing Nutrient Pollution Beyond Farmers" project aims to build the scientific foundation for a new governance framework, centered around all the major actors in the agri-food system – from fertilizer manufacturers to supermarkets. This policy brief introduces the first proof of concept of this new approach, developed in collaboration with the Sciences Po Law Clinic and focused on the "*algues vertes*" problem in Brittany, which resulted in nine new policy proposals to address this seemingly intractable problem that span the entire agri-food system.

RÉSUMÉ

La pollution par les nutriments est une menace environnementale majeure, alimentée par l'utilisation d'engrais synthétiques et de fumier. Pour y pallier, la plupart des politiques publiques se concentrent sur le changement de comportement des agriculteurs et ne tiennent pas compte des réalités sous-jacentes qui contraignent leur comportement. Le projet "Governing Nutrient Pollution Beyond Farmers" vise à établir les fondements scientifiques d'un nouveau cadre de gouvernance, centré sur tous les acteurs du système agroalimentaire, des fabricants d'engrais aux supermarchés. Ce Policy Brief propose une première présentation de cette approche novatrice, développée en collaboration avec la Clinique de l'Ecole de droit de Sciences Po et centrée sur la problématique des "algues vertes" en Bretagne. Celle-ci permet d'identifier neuf nouvelles propositions de politiques publiques pour résoudre un problème réputé insoluble qui touche l'ensemble du système agro-alimentaire.

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Introduction

Nutrient pollution is one of the most important threats facing the environment and human health. Fueled by the exponential rise in synthetic fertilizer and manure use in the aftermath of World War II, the loss of nitrogen (N) and phosphorus (P) to the environment makes almost every major environmental and human health problem worse and harder to manage – from air and water pollution, to climate change and biodiversity loss. It is one of only four planetary boundaries that humanity has surpassed – a level of human interference beyond which damage is expected to increase dramatically, with potentially irreversible consequences. And yet N and P are also essential inputs and therefore crucial to agricultural production. The Haber-Bosch process – the industrial synthesis of ammonia, the main feedstock for all N fertilizer types – enabled an increase in food production that is now responsible for feeding half of the world's population. And 90% of the P annually mined from geological deposits is used for agricultural production. Managing this delicate balance between environmental protection and agricultural production is the central challenge of nutrient pollution governance. However, the narrow focus of most agricultural nutrient pollution policies on changing farmer behavior ignores the underlying forces and actors that shape and constrain this behavior. This has led to policies which have been largely ineffective in reducing agricultural nutrient losses to the environment in Europe and around the world .

The "Governing Nutrient Pollution Beyond Farmers" (NuGov) project aims to address this by developing a new approach to nutrient pollution governance in the EU, focused on all the major actors in the agri-food system beyond the farm that influence farm-level nutrient management decisions – from fertilizer manufacturers to supermarkets. Doing so shifts the regulatory burden away from the farmer towards the underlying power structures that shape farmer behavior, and opens up a much larger array of governance options. For example, new fertilizer performance standards for the fertilizer industry would give farmers little choice but to use more environmentally friendly fertilizers. And imposing stricter treatment standards on wastewater companies to increase the availability of recycled wastewater as a nutrient input would encourage farmers to seriously consider it as a nutrient source.

The NuGov project is organized around four objectives:

1) Map the forces that influence farmer nutrient management decisions;

2) Design new governance options in collaboration with university law clinics;

3) Develop transition pathways consistent with the Farm to Fork Strategy, and create new policy mixes that could implement them;

4) Synthesize the project findings into an integrative whole comprised of synthesis papers, policy reports and recommendations.

This Policy Brief focuses on one of the first proofs of concept of NuGov's second objective (designing new governance options) developed in collaboration with the Sciences Po Law Clinic, focusing on the "algues vertes" problem in Brittany. The outcomes are presented in this policy brief. Looking ahead, this new framework could make an important contribution to improving the design, implementation and evaluation of agricultural nutrient pollution policies in the EU and beyond.

1. Literature review

The EU's agricultural sector is one of the world's largest sources of nutrient pollution. Using current fertilizer prices, which have skyrocketed as a result of the war in Ukraine, the market value of N and P lost to the environment is equivalent to 14%-21% of the budget of the EU's Common Agricultural Policy. And despite a range of EU and Member State policies and legal rulings aimed at addressing the issue, many ecosystems still suffer from excessive N deposition, approximately half of European water monitoring stations show no significant change in nitrate contamination, with over 25% measuring increasing levels, and agricultural nitrous oxide emissions have not declined since the Cold War.

Despite, or perhaps because of this lack of progress, the EU has put nutrient pollution at the heart of its Farm to Fork Strategy (F2F) – the food system pillar of the European Green Deal. In addition to targets aiming to reduce pesticide use and antimicrobial sales by 50% and increase the proportion of land devoted to organic agriculture to 25%, F2F proposes to halve nutrient losses to the environment and reduce synthetic fertilizer use by 20% by 2030. These are extremely ambitious (though technically achievable) objectives that have been echoed in other international fora, notably the Colombo Declaration and recent UN biodiversity negotiations. How these objectives will be implemented in practice is unclear – a 2022 survey of experts from academia, thinktanks, NGOs and the private sector revealed that the goal of a "healthy food system for people and planet" should

"Managing the delicate balance between environmental protection and agricultural production is the central challenge of nutrient pollution governance."

be both one of the top priorities of the European Green Deal and yet where the least progress has been made. The lack of success of the current suite of agricultural nutrient pollution policies in the EU points to the need for a new approach that draws on insights and tools from multiple disciplines and stakeholders, which is the main objective of the NuGov project.

1.1. The limits of existing governance proposals

Many studies have explored different governance options to address agricultural nutrient pollution, from reforms to EU water governance to an overhaul of the Common Agricultural Policy. At the heart of almost all of these governance proposals is the relatively simplistic assumption that what is currently lacking in agricultural nutrient pollution policies is a better understanding of farmers themselves, including the right collection of economic incentives or information to change their behavior. This narrow focus on the farmer decision-making space ignores the fact that farmers are subject to a range of economic, regulatory, cultural and informational constraints that severely limit their ability to meaningfully change their nutrient management practices. And these constraints – ranging from restrictive production contracts to farm advisor conflicts of interest – are rarely the focus of research or policymaking. Instead, models of farmer behavior tend to collapse the diverse actors and institutions that shape, constrain and driver farmer-decision-making into simply the "policy context". Indeed, a recent meta-analysis of 121 peer-reviewed studies analyzing farmer adoption of best management practices found that only seven included "macro factors" beyond the farm, with just two directly evaluating the "roles of policies, markets, business, or agencies". A governance system that fails to take these constraints into account in the design of new option is therefore overlooking a vitally important set of determinants of farmer nutrient management. The NuGov project proposes to make these constraints a central research focus, and lay the scientific foundation for a new governance framework devoted to directly addressing the actors and forces that create and sustain them.

The Brittany case study described below – carried out in collaboration with the Sciences Po Law Clinic – is the first proof of concept of a key component of this new research perspective on nutrient pollution governance.

2. "Algues vertes" case study

Brittany is a major agricultural region of France and the EU, especially for livestock production. It produces 56% of France's pork, 44% of its eggs, 33% of its poultry and 22% of its milk, despite only constituting 5% of France's land surface. This extremely high concentration of livestock production leads to a large amount of nutrient excretion in manure and urine, which, despite a range of measures implemented by farmers and policies put in place from local to European scales, drives enormous nutrient pollution flows. Consequently, algae blooms continue to occur frequently and at large scales in Brittany, causing beach closings in addition to human and animal casualties. A central reason for the inadequacy of current policies is the lack of consideration given to other actors in the agri-food system who significantly influence farmlevel practices (Cour des comptes, 2021). Consequently, the Brittany case study focuses on these actors beyond the farm – from multinational food companies, to farmer cooperatives and educational institutions, to banks and insurance companies, among others, with the aim of driving further reductions in nitrate losses.

2.1. Methods

Law clinics are a unique experiential environment that provide law students an interface between their academic training and the issues and clients that their training could impact, and researchers with an exciting tool for legal innovation. They can generate legal analysis that provides more actionable insights and allows for more experimentation and creativity than traditional legal methods.

The first year of the collaboration with the Sciences Po Law Clinic involved three students and the project lead. It began with an in-depth examination of the systems of governance currently in place at local, national and European levels to address nutrient pollution in Brittany with a focus on the actors directly and indirectly implicated. After a preliminary brainstorming of alternative governance options halfway through the academic year, the group spent four days in Brittany interviewing ~20 stakeholders, and subsequent weeks interviewing another ~20 stakeholders – including farmers, scientists, local and national policymakers, NGO and industry representatives and educators – in order to refine and build on their proposals. This was then followed by an in-depth and structured brainstorming session using concept knowledge (CK) theory to organize both our knowledge of the topic and enable the group to be fully creative in developing its policy ideas. A series of ~30 policy proposals was whittled down to nine (covering all major actors, scales and policy approaches in the agri-food system), which became the focus of an independent report that was published by the Sciences Po Law Clinic in June 2022 (Chiasson et al., 2022). The nine proposals are described below and Figure 1 illustrates their distribution across the agri-food system. We

organize the proposals into three categories:

1) "Engage actors beyond the farm", which specifically targets non-farmer actors across the agri-food system;

2) "Stimulate the transition", which focuses on actions that stimulate a more profound transition of France's agricultural system towards agro-ecology and/or a circular economy;

3) Cross-cutting measures, which focus on actions that value farmers of the present and the future in terms of their contributions to research and education.

#	Name	Description
Engage actors beyond the farm		
1	Target the incentives driving fertilizer advice and sales	Reform the agricultural advisory business-model - shifting away from quantity-based compensation and towards a service-based compensation scheme. This could include a legal responsibility to stimulate nitrogen loss reductions.
2	Flexible VAT rates depending on a food product's nitrogen foodpoint	Use the flexibility allowed for by the European Union to raise VAT on products with a high nitrogen footprint and lower VAT for products with a lower footprint.
3	Integrate the mitigation of nitrogen pollution into corporate due diligence requirements	A new guidance document outlining the responsibility major corporations (from food producers to banks and insurance companies) have to reduce nitrogen pollution across their value chains.
Stimulate transition		
4	Leverage animal welfare efforts	Make animal welfare requirements more stringent, thereby requiring a larger surface area per animal, which should, on average, reduce nitrogen pollution flows per unit area (due to the lower number of animals). On the supply side, this could be stimulated via an investment program to improve existing livestock infrastructure. On the demand side, a labeling program to better inform consumers.
5	Maintain buffer zones to limit nitrate run-off	Financing of buffer zones could be extended beyond the planting of trees and hedges to include ongoing maintenance.
6	Monetize livestock waste to limit over-application	Create a Brittany manure market, including the online interface and the logistical support system behind it, to connect sellers and buyers of organic nutrients and transform manure from a waste product to an important input.
Cross-cutting measures: Financing and training		
7	Formally recognize the role of farmer-researcher	Formalize the role of farmer-researcher, which would make farmers with this title eligible for tax credits and enable large-scale data collection, which would be especially useful for scientists working on the transition towards more sustainable agriculture
8	Train and mentor current farmers in nitrogen best management practices and technologies	Create a new training and certification ("certinitrates") for farmers exclusively focused on addressing nitrogen pollution. The onus would be on educational and commercial institutions, such as the regional Chambre d'Agriculture, to develop such materials.
9	Train farmers of the future	For young people training to become the farmers of tomorrow, begin teaching on nitrate pollution at the secondary school level

Our policy proposals (numbered #1 through #9), positioned at the points in the agri-food system where they would take effect. The flags represent the scale at which the proposals would be implemented (regional, national et European).

2.2. Findings

These nine policy proposals represent a new way of thinking about harmful algae bloom governance in Brittany. However, these proposals will only be relevant and implementable if they are adopted and adapted by the policymakers and various stakeholders in the agri-food system to which they apply. This list is, of course, non-exhaustive, with many more proposals possible.

Conclusion: Next steps

Looking ahead, the NuGov project aims to build on the work of the Sciences Po Law clinic by expanding the focus to two other Member States: Spain and The Netherlands, working with law clinics at the University of Amsterdam and the University of Barcelona. The Netherlands is the second largest food exporter in the world, which has come with a host of environmental problems, most notably nutrient pollution. A recent Dutch Supreme Court decision found the Dutch government to be out of compliance with their commitments under the EU Habitats Directive, due to high levels of nitrogen deposition in many vulnerable ecological zones. This led to drastic proposals from the Dutch government in order to comply, including lowering speed limits and slashing livestock numbers, which also sparked a significant backlash from farmers. Spain adds a different climate (Mediterranean) and agricultural dimension to the project (dominated by livestock and fruit and vegetable production), with significantly lower nutrient surpluses than France and the Netherlands. It is also at the forefront of some unique policy developments, including a recent law granting legal personhood to the Mar Menor – Europe's largest saltwater lagoon and one of the more iconic European ecosystems severely impacted by nutrient pollution. Together, these three Member States allow for a range of contexts to be considered and project outputs to be better tailored to stakeholder needs.

The next steps of the NuGov project are structured around four research objectives that combine a transdisciplinary and multi-scale array of approaches and methodologies:

1) Map the forces that currently shape and constrain farmer nutrient management decisions in the EU, France, Spain and the Netherlands;

2) Design new governance options in

collaboration with university law clinics in France, Spain and The Netherlands;

3) Develop EU and national transition pathways consistent with the nutrient pollution targets in the Farm to Fork Strategy, and create new policy mixes that could implement them;

4) Synthesize the project findings into an integrative whole comprised of synthesis papers, as well as boundary objects such as policy reports and recommendations.

These research objectives require a suite of methodologies that will be combined for the first time in this project: participatory systems mapping, law clinic research, comparative cast studies, backcasting and policy mix design. Together they will deliver a new set of analytical tools, governance options and decision support systems that could support the implementation of the ambitious nutrient pollution targets at the heart of the EU's Farm to Fork Strategy and the European Green Deal.

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Directrice de publication :
Anne Revillard

Edition et maquette :
Andreana Khristova
Ariane Lacaze

Sciences Po - LIEPP
27 rue Saint Guillaume
75007 Paris - France
+33(0)1.45.49.83.61