TO CUT FOOD PRODUCTION!

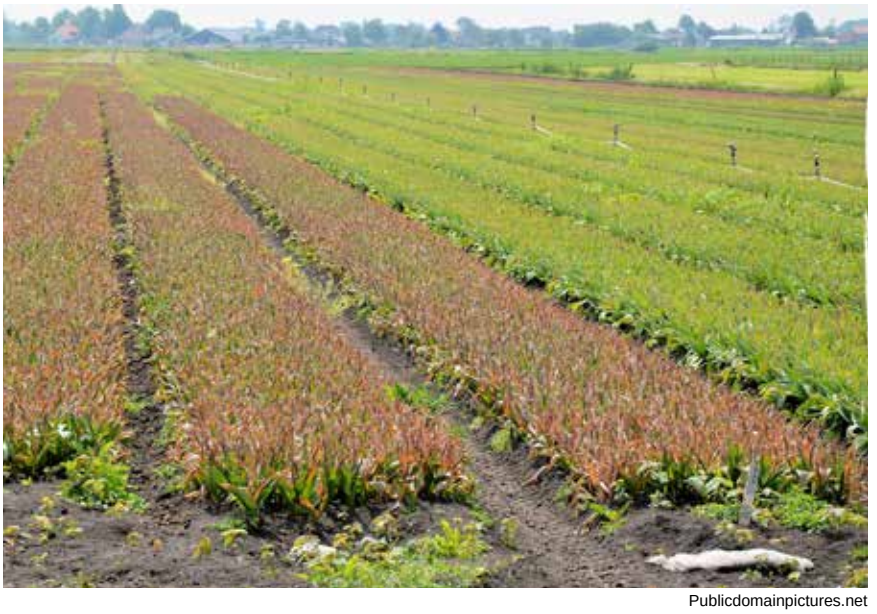
The Ersatz Nitrogen Crisis

Delusional Expertocracy and the Destruction of Dutch Agriculture

by Dr. Jaap C. Hanekamp

The Dutch government alleges a "nitrogen crisis" in parallel with the phony "CO_2 crisis". Combustion of fuel produces nitrogen oxides, animal manure is rich in ammonia, NH_3, and artificial fertilizers are nitrogen rich. The government's plans to force large cuts in the production of nitrogen compounds include reducing the country's livestock by one-third over the next eight years. But farmers and scientists are exposing and rejecting the plan as fraudulent.

The following article, written March 14, 2023, was originally published here on the author's website, jaaphanekamp.com. EIR is reprinting it with permission of the author, an Associate Professor of Chemistry at Utrecht University in The Netherlands. Explanatory footnotes have been added.



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Using pseudoscientific methods of analysis, the Dutch government claims that current farming practices are depositing harmful amounts of nitrogen in the soil. Their answer: farmers must produce less food.

Introduction

The Dutch "nitrogen crisis" revolves around the misconception that the quality of nature is *predominantly determined by N-deposition coming from agriculture*. That is to say: N-deposition [deposition of nitrogen] is regarded as a "nature-quality thermostat" which can be positively regulated by forcefully shrinking Dutch agriculture.

It is clear that the Dutch government embraces a disastrous expertocracy to try to control national agriculture top-down via nitrogen (compounds) and their ostensibly apocalyptic consequences on nature.

Current agriculture is "bad," according to the extirpative expertocracy. This applies to nitrogen but also to CO_2, which now needs to be taxed so as to "nudge" people away from animal products such as meat, milk and cheese.

We will see whether the Dutch population buys into the nitrogen delusion—the upcoming province elections that will impact national politics as well, will be an indicator.

Nevertheless, the Dutch nitrogen delusion seriously undermines the most basic of human endeavors—the production of food—and stands as a stark warning to the rest of the (agricultural) world.

The Delusion in Two Acts

The Dutch nitrogen "crisis" boils down to two "acts": a *software model* that simulates N-deposition and a *standard* that ostensibly defines N-deposition limits beyond which damage to nature cannot be excluded. The model is AERIUS and the standard is the

Nitrogen Critical Load (NCL). Combined, these two have created the "crisis" as we now know it in the Netherlands.

As we will see, this crisis is wholly artificial. We should call it the Dutch nitrogen delusion.

Nevertheless, it is advertised by the expertocracy, politicians, and the media as a genuine emergency we have to solve at great financial, economic, social and personal cost. By the way: these massive expenditures are devoid of any benefit-cost analyses (see further below)!

To understand the delusion, we have to understand what NCL are and how well AERIUS works (if at all). Let's start with the model, as it plays a central role in the Dutch nitrogen delusion.

AERIUS: Misadventures in Modelling

The National Institute for Public Health and the Environment (RIVM) develops and manages the calculating tools—AERIUS—that are used to model the emission and deposition of nitrogen on Natura 2000 sites. The Operational Priority Substances model (OPS) is the mathematical heart of AERIUS and was introduced in 1989.

OPS is presented as a model that simulates the atmospheric process sequence of emission, dispersion, transport, chemical conversion and deposition. The model is set up as a universal framework supporting the modelling of a wide variety of pollutants, and one of its main purposes is to calculate the deposition of acidifying compounds over the Netherlands at a high spatial resolution.

The billion-dollar question is: what kind of accuracy is delivered by OPS?

This is an important question as, by and large, two things are done with OPS that are of interest here: it purportedly calculates a yearly background N-deposition from all (national and international) sources and it calculates the N-deposition contribution of a specific activity (source)—say, a farm that plans to change its cattle-numbers—to the background.

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The mathematical tools that the Dutch National Institute for Public Health and the Environment uses to model (estimate) the emission and deposition of nitrogen are incompetent and should not be used.

It should be noted that OPS, in AERIUS, does not model deposition as such, but makes estimations of sorts that contain some kind of uncertainty. Modelling is not problematical *per se*, as measuring dry N-deposition (as in N-deposition not found in precipitation) is not done successfully anywhere.

By RIVM's own admission, uncertainties with respect to nationally distributed ecosystems are estimated at 25–30% for NO*y* and NH*x*, respectively.[1] For specific ecosystems (500m × 500m to 5000m × 5000m) uncertainties are higher: 60–100% for NO*y* and NH*x* deposition, respectively.

However, things prove to be much worse for OPS.

The 2019–2020 Scientific Advisory Committee on Nitrogen, of which yours truly was a member, already noted that AERIUS cannot model N-deposition related to specific activities (farms) with any kind of satisfactory precision as to provide or extend environmental licenses to that activity.

This crystal-clear verdict is rarely mentioned anywhere and still is not taken on board within regulation!

1. NO*y* refers to NO, NO_2, and all oxidized atmospheric odd-nitrogen species combined (including HNO_3, HNO_2, and others). NH*x* refers to a combination of species, of which ammonia, NH_3, is the most abundant in agriculture.

TABLE 1
Results of the AERIUS Model for Various Scenarios

Cows	Total deposition (mol N/ha/year)	Deposition from cows
0	1938	0
1	1938.07	0.01
100	1939.52	1.47
200	1940.99	2.93
400	1943.92	5.87

Nitrogen deposition according to herd size. The "0" cows line shows just the background deposition. Total depositions (background plus cows) are given in moles of nitrogen per hectare per year. One mole of nitrogen atoms is 14 grams. Column 3 shows the estimated deposition from cows alone.

Additionally, in March 2022 the OPS-validation studies were made public after an FOIA request. These studies, surprisingly, had not been made available to the Scientific Advisory Committee on Nitrogen!

Friend and colleague Matt Briggs analyzed these validation studies extensively, which showed OPS to be garbage. Our findings are summarized in "Criticizing AERIUS/OPS Model Performance" and our "Rebuttal on RIVM's Critique of Briggs et al. AERIUS/OPS Model Performance."

The latter was published after the RIVM delivered the underlying data of the validation studies and published a "rebuttal" of sorts to our first analysis. The following are our main conclusions:

- The genuine validation studies concede the model performs poorly;
- AERIUS/OPS often cannot outperform a simple "mean" model; that is, a simple model beats AERIUS/OPS's predictions. AERIUS/OPS thus has no skill and should therefore be jettisoned;
- The verification measures used in previous studies are substandard and incomplete, resulting in actual poor performance seen cosmetically as adequate;
- Uncertainty is poorly addressed within OPS simulations;
- Calculating straightforward scenarios on AERIUS produces results which are trivial and not measurable. For instance, reducing a farm's cattle by 50% decreased nitrogen deposition by 0.1%, an "event" well within the margin of measurement and modeling errors (see **Table 1**);
- Given its many failures, lack of skill, and general poor performance, AERIUS/OPS should not be used for any decision making. A full verification, and improvements flowing from those verifications, are needed before the model can be trusted.

It is clear that OPS within AERIUS should not be operational in the first place. It proved to be without skill from its inception. It is incapable of simulating N-deposition with any meaningful precision. Be that as it may: AERIUS is still in use to this very day.

The solution to all these and other issues is to design experiments, and independently (separately from the RIVM!) test OPS on completely new data. Pending those experiments, OPS must be shelved so as to forestall extensive societal and economic damages resulting from its continued use in policy making.

Two interesting things happened recently with respect to this model: a court case against the Dutch State has been initiated to put AERIUS on hold, and a parliamentary member—Pieter Omtzigt—has asked the Dutch government to legally analyze AERIUS' fitness for purpose.

Nitrogen Critical Loads: Fabricated Ecological Exactitude

The nitrogen critical loads (NCL) form the standards to which N-deposition, as (poorly!) modelled by AERIUS, is benchmarked. How should we understand NCL ecologically? Let's have a look.

A critical load (CL) is an official level of exposure to a substance above which environmental harm is said to be likely to occur. These loads are mostly presented as atmospheric deposition rates of kilograms per hectare per year. The focus is on nitrogen (N) compounds and thus NCL are on the table here. The 1988 report, "Critical Loads for Sulphur and Nitrogen," defines CL as—

> A quantitative estimate of an exposure to one or more pollutants below which significant harmful effects on specified sensitive elements of the environment do not occur according to present knowledge.

This 1988 CL definition is referred to as more or less canonical. Just the same, CL definitions are general in scope, and need at least some specification with respect

to *endpoints* and *ecologies* (types of ecosystems).

The former are mostly described as eutrophication,[2] acidification, and pressures on biodiversity (species richness). The latter refers to all sorts of habitats such as marine habitats (EUNIS[3] class A), coastal habitats (EUNIS class B), inland surface water habitats (EUNIS class C), and so on. EUNIS stands for European Nature Information System.

Inexplicably, in the Netherlands, NCL are presented as "unique singular values," used to ostensibly determine deterioration of ecosystems once N-deposition, as simulated by AERIUS(!), exceeds these singular values. As recently stated in the 2022 report, "Review and Revision of the Empirical Critical Loads of Nitrogen for Europe":

> These critical loads for N deposition … are the given standard in The Netherlands, and are also *accepted by the government and by the judges of the highest administrative court. And because these critical loads have unique values instead of ranges, it is clear whether or not the critical load of a specific habitat is exceeded.* (p. 326; emphasis added.)

Scientifically, it is irrelevant whether or not NCL are accepted by governments and/or legal bodies. These endorsements cannot and do not bolster ecological claims made with NCL and the professed ecological consequences if exceeded.

In fact, those establishing NCL seem to have a need to revert to the fallacy of the appeal to authority to underpin their work.

In a paper published last year, friend and colleague Matt Briggs and yours truly tallied the many deficiencies in some paradigmatical papers on NCL. For one, critical loads definitions are unclear with respect to repeatable or consistent measures on plant measurements or chemistry, for instance:

> Whatever critical load is, it cannot change from one thing to another; change in measure, that is. *Change in itself is neither good nor bad.* That the different studies that showed, for instance, how the length of a particular *Sphagnum*[4] species is changed on average in some way is not, by itself, of interest. It must be specified why some level of growth, if only growth is considered, is good or bad in some decisional manner. (Emphasis added.)

This is only the beginning of the NCL woes we found in the assessed NCL papers. Uncertainty and the ways in which it is not addressed in the CL discourse proved to be a most worrisome topic. The widespread misunderstanding of statistics in the ecological community—friend Briggs can explain all about the significance fallacy—only makes things worse.

Unrecognized factors of uncertainty in NCL bring us back to the ostensible "unique values" for NCL. This is nothing other than pseudoscience. The ecological precision suggested in these "unique values for NCL" is bogus and conjured out of thin air.

Ruining Society with *Faux* Science

The powers that be in the Netherlands thus have chosen a "unique" approach to its agricultural community and thereby the rest of the population. It has chosen to forcefully curtail its centuries-old capacity to deliver quality food products to the Dutch and European markets for purely chimerical ecological reasons, even without any proper benefit-cost analysis.

That is foolish and dangerous for numerous reasons. I will address five.

First, all peoples in world history have tried to take care of their own food production. The story of Joseph in Egypt as found in *Genesis* 41 and onward is but one very ancient example. It is irrelevant whether this story is historical to some degree or not. What matters here for my purposes is that food production (and proper storage) always had tremendous and recognized strategic value! Nothing has changed since ancient times.

Ignoring the strategic value of national food production is uniquely stupid and courts disaster.

Second, expertocracy is no substitute for good farming. Science can be a great help in improving farming, and the Netherlands is a fantastic example of this. However, the bloated expertocracy we observe in the nitrogen delusion will harm the Dutch agricultural sector and the Dutch population, while the expertocracy re-

2. Eutrophication is the progressive enrichment of a body of water in minerals and nutrients.

3. EUNIS is a comprehensive habitat classification system for Europe.

4. *Sphagnum* is a genus of mosses.

mains out of harm's way.

A classic example of expertocracy having no skin in the game. Obviously.

Third, scientific knowledge by itself, even of the highest quality, is never (really: as in never) enough reason for any kind of decision. Scientific knowledge is but one aspect amongst many others. Social, economic, cultural, religious, historical, and strategic aspects of the issue at hand have to be brought to the table in order to make any kind of well-informed decision.

A simple example will suffice: Is it the case that because I scientifically fully understand "the model die" (the probability to throw a 6 with one die is 1/6), *I therefore must place a bet* in some game that uses this "model"? *Of course not!*

Many other aspects influence the making of that choice. I might be very much against betting because of my religious beliefs, or I simply do not want to put my money on the line for some futile game, or I have no trust in my ability to properly throw a die (for whatever reason), and so on.

Fourth, the "science" that is used in the Dutch nitrogen delusion is of the worst kind. Reiterating, both NCL and AERIUS simulations are presented with nonexistent numerical precision that delivers no proper insights into the quality of nature. Sure, uncertainty is discussed within the nitrogen discourse, yet it has no bearing on the actual use of NCL and AERIUS whatsoever.

Fifth, even if we grant that "the science" is clear cut—and we do not!—*the Dutch nitrogen delusion lacks any kind of broad societal benefit-cost analysis*. Worse, with all the money poured into this delusion, there is no assessment forthcoming whether nature will profit at all by curtailing Dutch agriculture.

In fact, all that is being said on the benefits to nature by decreasing N-deposition via the reduction of agricultural activities reverts back to the pseudoscientific "unique value NCL" and shoddy AERIUS simulations. *This is nothing other than circular reasoning!*

Small wonder that this House of Parliament's motion on benefit-cost analyses related to nature protection and N-deposition was never executed. The regulators and their expertocracy know they stand empty handed!

The conclusion is inevitable: The Dutch nitrogen delusion is prototypical dystopianism, resulting from a blatant scientistic, authoritarian and thus utopian demand for a "reconstructed agriculture." (See my second dissertation, *Utopia and Gospel.*)

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"The probability of throwing a six with one die is 1/6. Must we therefore place a bet in some game that uses this 'model'? Of course not!"

This *non-existent* "new and improved agriculture" is *deus ex machina,* "much better" than the present one. This nirvana argument is presented, obviously, without so much as a shred of evidence. *And that makes the expertocracy involved nothing other than magicians, fabricating a future world that is knowingly incoherent.*