

Cross-Border Impact Assessment 2022

Dossier 7: The cross-border effects of the Dutch Nitrogen policy (student dossier)



Maastricht University

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The *Institute for Transnational and Euregional cross-border cooperation and Mobility / ITEM* is the pivot of research, counselling, knowledge exchange and training activities with regard to cross-border mobility and cooperation.

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List of abbreviations

BE	Belgium
CBS	Centraal Bureau voor de Statistiek (Statistics Netherlands)
CRA-W	Centre Wallon de Recherche en Agronomie (Walloon research centre for agriculture)
DE	Germany
EEA	European Environmental agency
EMR	Euregio Meuse-Rhine
EU	European Union
FWA	Federation Wallonne de l'agriculture (Walloon Federation for Agriculture)
GIS	Geographic Information System
GDP	Gross Domestic Product
ILVO	Instituut voor Landbouw-Visserij - En Voedingsonderzoek (Flanders Research Institute for Agriculture, Fisheries and Food)
KDW	Kritische depositiewaarden (critical deposition value)
LLTB	Limburgse Land-en Tuinbouwbond (Limburg Agricultural and Horticultural Union)
N2	Nitrogen
NEC	National Emissions Ceilings
NH3	Ammonia
NL	The Netherlands
NOx	Nitrogen Oxides
NRW	Nordrhine-Westfalen
PAS	Programma Aanpak
PGDA	Plan de gestion durable de l'azote (Sustainable Nitrogen Management Program)
RIVM	Rijksinstituut voor Volksgezondheid en Milieu (National Institute for Public Health and the Environment)
SCI	Sites of Community importance
SPA	Special Protection Areas
SPW	Service Public de Wallonie (Walloon Public Service)
SPZ-H	Special Protection Zones
TFEU	Treaty on the functioning of the EU
PM2.5	Particle matter 2.5
UMB	Umwelt Bundesamt (German Federal Environment Agency)
VMM	Vlaamse Milieumaatschappij (Flanders environment agency)

Introduction

In 2020, the Netherlands exported €95.6 billion of agricultural goods, making it by far the largest European Union (EU) exporter and the second largest worldwide.¹ Salient for the Dutch economy, the agricultural sector accounted for over €40 billion of the Dutch economy in 2020,² employed around 30 thousand workers,³ and represented around 7% of the Dutch Gross Domestic Product (GDP).⁴ However, such a large agricultural production does not come without environmental issues.

Environmental issues are challenging to overcome as they generally do not comply with our socially constructed borders and, thus, either collide with or transcend nationally focused policies. These challenges are often exacerbated by the political, cultural, or economical conflicts of interest between different countries. To overcome these issues, cross-border policies are therefore imperative.

The EU started to address environmental issues in the mid-1990s through the awareness raised by civil-society actors at the Kyoto protocol in 1997, the ground-breaking agreement that committed industrialised countries to reduce their greenhouse gasses. By committing to a binding agreement, the EU stepped up its role as leader by example. The Birds, Nitrates and Habitats directives adopted respectively in 1979, 1991 and 1992,⁵ reinforced the EU's commitment to protecting biodiversity and tackling Climate Change effects. However, these directives are still regularly being breached. Among the various sectors in which environmental directives are breached, agriculture stands out as the largest emitter of ammonia (NH₃).

Ammonia and nitrogen oxides (NO_x) are compounds which partly consist of nitrogen. Nitrogen (N₂) makes up over 78% of the atmosphere in its pure element form. Thus, despite being an important nutrient for plant growth and essential for protein formation,⁶ in excessive amounts, NO_x is harmful to the environment and our health. In general, nitrogen emissions come from various sectors, including construction, households, the energy sector (a form of NO_x) and agriculture (through NH₃ in fertilisers). NO_x emissions mostly come from burning fossil fuels in traffic, fertiliser production, power plants, industry, and households. NH₃ mostly originates from animals and artificial fertiliser from livestock farming (mostly animal husbandry), and to a lesser extent from sectors such as construction, traffic, and industry. NO_x and NH₃ have an effect on air, soil and water quality,⁷ causing harm to the ecosystem and human health. Increased nitrogen emissions have several consequences: they have a

¹ CBS, 'Agricultural exports staying rooted' (2021), <https://www.cbs.nl/en-gb/news/2021/03/agricultural-exports-staying-rooted>.

² Ibid.

³ CBS, 'Nearly 30 thousand contract workers in agriculture' (2020), <https://www.cbs.nl/en-gb/news/2020/15/nearly-30-thousand-contract-workers-in-agriculture>.

⁴ J. Schneider et al., Are agri-food workers only exploited in Southern Europe? Case studies on migrant labour in Germany, the Netherlands, and Sweden, Open Society European Policy Institute.

⁵ Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds [2010] OJ L 20/7; Council Directive 91/676/EEC of 12 December 1991 concerning the protection of waters against pollution caused by nitrates from agricultural sources [1991] OJ L 375/1; Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora [1992] OJ L 206/7.

⁶ MS. Reijneker and JW. Bol, 'Nitrogen', *Wageningen University & Research*, <https://www.wur.nl/en/Dossiers/file/Nitrogen.htm>.

⁷ Ibid.; W. de Vries, 'Impacts of nitrogen emissions on ecosystems and human health: A mini review', *ELSEVIER* (2021); European Environmental Agency, 'Nitrogen oxides (NO_x) emissions', <https://www.eea.europa.eu/data-and-maps/indicators/eea-32-nitrogen-oxides-nox-emissions-1/assessment.2010-08-19.0140149032-3>.

negative impact on the growth of vegetation, can lead to soil and water eutrophication as well as acidification, they contribute to acid deposition, and decrease biodiversity.⁸ Increased ammonia concentration causes damage to plants, which can result in pest attacks or fungal infections.⁹

Nitrogen surplus has been a major issue in European countries for many years. Action plans by the European Environmental Agency (EEA) successfully reduced emissions of NOx by 44% between 1990 and 2011. An estimate of the emission change per sector shows that the new technologies in road transportation throughout the years have led to the highest and most constant decrease in nitrogen oxide emissions: 48% since 1990. This decrease failed to predict the concentration change of NO₂ in urban areas, the emission of which has not followed the decrease. A significant decrease can be seen in the NOx emissions of the electricity/energy-production sector too, while agricultural emissions were reduced by 19%.¹⁰

Reducing nitrogen deposition requires a comprehensive solution considering all the affected sectors. There are several ways to reduce emissions, and with constantly evolving technology, new methods become available. Nitrogen oxides and ammonia emissions in the transportation sector can be reduced using new, more environmentally friendly technology and by reducing imports. In agriculture, there are various possible solutions to limit the nitrogen emissions, such as shrinking the livestock population, reducing nitrogen-based fertiliser production, processing manure, reducing the ammonia emission from manure (e.g. by decreasing the protein concentration in feed), processing wastewater and applying efficient air filtration in manure and wastewater processing areas.¹¹

Natural habitats, especially Natura 2000 areas, are endangered by the exorbitant deposition of nitrogen. Natura 2000 areas are nature reserves designated by the EU Birds Directive (2009/147/EC) and Habitats Directive (92/43/EEC) for the protection and restoration of European biodiversity.¹² Specifically, the aim is to protect endangered species and habitat types. There are two types of Natura 2000 areas: sites of community importance (SCI), which target endangered habitats, and Special Protection Areas (SPA), which protect endangered Birds species. Approximately 27,000 sites have been designated as Natura 2000 areas across the EU. Of these, 161 are located in the Netherlands. Figure 1 shows the Natura 2000 areas in the Euregion Meuse-Rhine. The selection of these areas is carried out solely by the environment agencies of the respective Member States. This means that, to date, no cross-border Natura 2000 areas have been created. There are however instances of cross-border

⁸ W. de Vries, *ELSEVIER* (2021); MS. Reijneker and JW. Bol, 'Nitrogen', *Wageningen University & Research*, <https://www.wur.nl/en/Dossiers/file/Nitrogen.htm>.

⁹ W. de Vries, *ELSEVIER* (2021).

¹⁰ European Environmental Agency, 'Nitrogen oxides (NOx) emissions', <https://www.eea.europa.eu/data-and-maps/indicators/eea-32-nitrogen-oxides-nox-emissions-1/assessment.2010-08-19.0140149032-3>.

¹¹ MS. Reijneker and JW. Bol, 'Nitrogen', *Wageningen University & Research*, <https://www.wur.nl/en/Dossiers/file/Nitrogen.htm>; T. Roth et al., 'Nitrogen deposition in negatively related to species richness and species composition of vascular plants and bryophytes in Swiss mountain grassland' *ELSEVIER* (2013); P. Geerdink, 'Investing in technology stimulates reduction of nitrogen emissions in agriculture', *Wageningen University & Research* (2021), <https://www.wur.nl/en/Research-Results/Research-Institutes/food-biobased-research/show-fbr/Investing-in-technology-stimulates-reduction-of-nitrogen-emissions-in-agriculture.htm>.

¹² European Environmental Agency, 'State of nature in the EU', <https://www.eea.europa.eu/publications/state-of-nature-in-the-eu-2020>; E. Koekkoek, 'Stikstofuitstoot Nederland: hoe zit het?' (Nitrogen emissions in the Netherlands: what about?), *KVK* (2022), <https://www.kvk.nl/advies-en-informatie/innovatie/duurzaam-ondernemen-oud/stikstofuitstoot-nederland-hoe-zit-het/>.

cooperation, such as in the *Zwin* area between Flanders and the Netherlands, or the *Green and Blue Rhine Alliance* between Germany and the Netherlands.

Overall, Natura 2000 areas in the Netherlands have been showing nitrogen surpluses for years on end. As a result, 80 areas are being closely monitored by the *Rijksinstituut voor Volksgezondheid en Milieu* (RIVM) (National Institute for Public Health and the Environment) due to high concentrations of NH₃ in the soil. Based on the two Directives named in the previous paragraph, 50% of the nitrogen-sensitive Natura 2000 areas must have a nitrogen deposition below the maximum nitrogen concentration manageable by the soil, also known as the *kritische depositiewaarde (KDW)* (critical deposition value).¹³ The KDW has been laid down in the regulation *Stikstofreductie en Natuurverbetering* to ensure declining nitrogen emissions over the coming years.¹⁴ The legislation establishes a 25-kilometre radius in which the KDW is measured for nitrogen emissions (i.e. NO_x or NH₃). This radius was decided upon as it is considered the maximum distance at which nitrogen emissions can still impact Natura 2000 areas. To support farmers, the Dutch government made € 473 million available for the buyout of livestock farms.¹⁵

In 2019, the *Raad van State* (Council of State), the highest administrative court of the Netherlands, passed judgement that the government is obliged take more robust action in reducing nitrogen emissions.¹⁶ Since then, several additional measures have been either implemented, including a reduction of the speed limit on highways, or elaborated further, such as subsidy schemes for stable adjustments.¹⁷ In the 2021 coalition agreement, the cabinet proclaimed new plans to cut the domestic nitrogen emissions by half by 2030 instead of 2035. The government allocated a 25-billion-euro package for this *Nationaal Programma Landelijk Gebied* (National Programme Domestic Areas).¹⁸ The nitrogen targets will be determined per region and will become legally binding for the provincial governments (*Gedeputeerde Staten*) in July 2023 at the latest.¹⁹ The Dutch Minister of Nature and Nitrogen, Christianne van der Wal, gave different examples of measures to be taken by the Dutch government, which include encouraging entrepreneurs to make their businesses more sustainable or accept a government buyout, and perhaps even the expropriation of entrepreneurs unwilling to choose either option.²⁰ She also mentioned domestic migration as an option to decrease the nitrogen emissions in Natura 2000 areas.

As a result of the new Dutch policy on reducing nitrogen emissions, the Dutch national and provincial governments will continue to implement such measures across different sectors in their respective

¹³ E. Koekkoek, 'Stikstofuitstoot Nederland: hoe zit het?', KVK (2022), <https://www.kvk.nl/advies-en-informatie/innovatie/duurzaam-ondernemen-oud/stikstofuitstoot-nederland-hoe-zit-het/>.

¹⁴ Ibid.

¹⁵ Aanpak Stikstof, 'Maatregel Gerichte Aankoop en beëindiging veehouderijen' (Measure Targeted Purchase and termination of livestock farms), <https://www.aanpakstikstof.nl/maatregelen/landbouw/regeling-provinciale-aankoop-veehouderijen>.

¹⁶ Ibid.

¹⁷ Ibid.

¹⁸ Ibid.; NRC, 'Minister Van der Wal over stikstofprobleem: 'Straks kunnen we geen schoon water meer uit de kraan drinken'' (Minister Van der Wal about the nitrogen issue: 'Soon we will not be able to drink clean tap water anymore'), 1 April 2022.

¹⁹ NRC, 'Minister Van der Wal over stikstofprobleem: 'Straks kunnen we geen schoon water meer uit de kraan drinken'', 1 April 2022.

²⁰ Ibid.

territories. While studies have been conducted to assess the national repercussions of the Dutch policy, studies have yet to show its impact on cross-border regions. This study aims to fill this gap and contribute to the literature by assessing the relevance of the Dutch policy in improving the nitrogen situation in the Euregion Meuse-Rhine. In this dossier, preliminary findings are discussed and recommendations for further research are made regarding the cross-border effects of the new Dutch nitrogen policy.

This dossier assumes that the implementation of this policy in the Netherlands may lead to, for example, (socioeconomic) advantages or disadvantages for Dutch farmers compared to their German and Belgian counterparts, which might in turn result in elevated rates of cross-border migration or a change in the relationships and collaborations between farmers in the Euregion. In addition, the question arises whether the measures will culminate in a reduction of nitrogen emissions in water, soil, and air or whether the policy will merely induce a transfer of nitrogen emissions within cross-border areas.

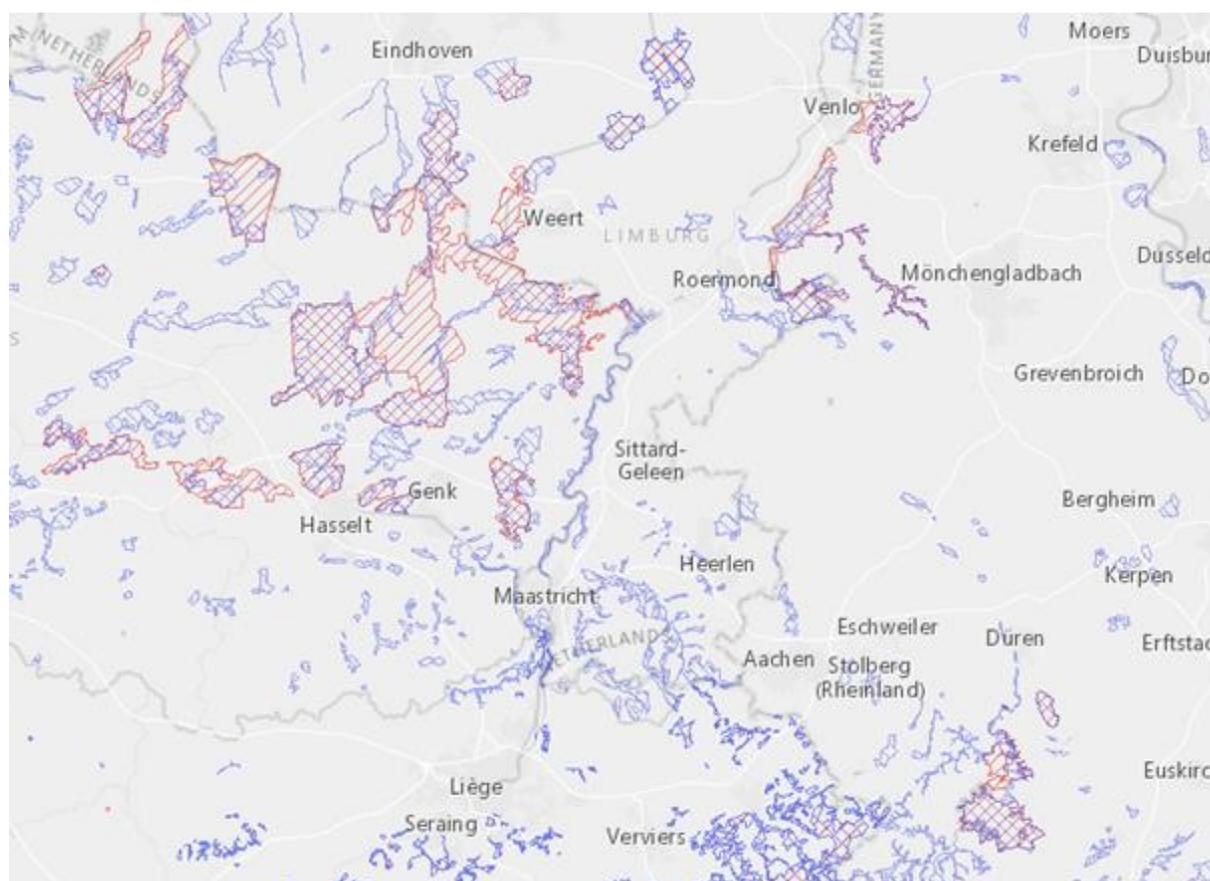


Figure 1: SCIs and SPAs in the Euregion Meuse-Rhine. Obtained from: Aerius (<https://calculator.aerius.nl/wnb/sources/>). Legend: blue areas are SCIs; red areas are SPAs.

1. Legislation

1.1 European Union Law

1.1.1 Nitrates Directive (Council Directive 91/676)

This Directive was adopted in 1991 with the purpose of promoting more sustainable agricultural practices to prevent nitrates from polluting water streams and groundwaters. An excessive concentration of nitrogen in water bodies is known to cause eutrophication of the seas and oceans, a phenomenon which has been observed in the North Sea.²¹ In practical terms, the Directive requires that competent authorities (national or regional) monitor the nitrogen concentrations in water bodies to establish zones particularly prone to nitrogen pollution (vulnerable zones). Once these zones have been identified, the authorities implement additional constraining measures to reduce the nitrogen pollution.

1.1.2 Article 191 of the Treaty on the Functioning of the European Union (TFEU)

The TFEU provides a framework for collaboration across borders. It aims at “promoting measures at international level to deal with regional or worldwide environmental problems”. Additionally, this Article sets forward certain objectives that the Union wishes to achieve with its Union policy on the environment. Subsequently, Article 192 TFEU acts as a legal basis that enables the Union to legislate, according to the Ordinary Legislative Procedure, in order to attain the objectives set out in Article 191 TFEU.

1.1.3 The Habitats Directive (Council Directive 92/43/EEC) and the Birds Directive (Directive 2009/147/EC)

These Directives were adopted in 1992 and 1979, respectively. Article 2 of the Habitats Directive sets out its purpose: The aim of the Directive is to preserve biodiversity, through the conservation of natural habitats and of wild fauna and flora, taking into account economic, social and cultural considerations. Air pollution coming from nitrogen directly affects the environment and, by extension, the habitat of hundreds of living species (over 1000 are listed in the Directive). Tackling this issue at cross-border level enables a much more comprehensive approach to the problem. Article 1 of the Birds Directive stipulates the purpose of the Directive, which is to protect all species of naturally occurring birds. Importantly, Article 3 of the Habitats Directive sets up the title Natura 2000, which entails a coherent Union ecological network of special areas of conservation. In more detail, Natura 2000 is a network that aims to protect rare and threatened species. This network is extended across all EU countries and includes both the land and the sea. The Birds Directive and the Habitats Directive both list valuable species which are under threat. Consequently, the purpose of the network is to ensure the survival of those species.

²¹ Anita Künitzer, Eutrophication in Europe’s coastal waters, European Environment Agency.

1.1.4 Infringement Procedures

	Netherlands:	Belgium:	Germany:
Nitrates Directive: (Council Directive 91/676/EEC). ²²	Case C-322/00: It was found that the Kingdom of Netherlands failed to fulfil its obligations under the Nitrates Directive	Formal Notice sent to Belgium (the Walloon Region). The Commission urged Belgium to comply with the EU's Nitrates Directive. ²³ Case C-221/03: Case against Belgium for failure to adopt the measures needed for the correct implementation of the Nitrates Directive. Failure of Belgium to meet its obligations. ²⁴	The European Commission is referring Germany to the CJEU for failure to act with regards to water pollution caused by nitrates ²⁵ 21 June 2018: The Court ruled that Germany breached EU law by exceeding the limits found under the Nitrates Directive (due to excessive use of manure as a fertiliser). ²⁶ If there is another ECJ judgment, Germany might face fines (of up to €850,000 per day). ²⁷
Habitats Directive: (Directive 92/43/EEC)	Formal Notice for failure of the Netherlands to fulfil its obligations under the Habitats Directive		The European Commission has referred Germany to the CJEU for not respecting its obligations under the Habitats Directive ²⁹

²² European Commission, 'The Nitrates Directive, Case-law relevant to the Nitrates Directive', <https://ec.europa.eu/environment/water/water-nitrates/case-law.html>.

²³ European Commission, 'July infringements package: key decisions' *Infringement decisions* (2020), https://ec.europa.eu/commission/presscorner/detail/EN/INF_20_1212; European Commission, 'Infringement Decisions' *European Commission at work*, https://ec.europa.eu/atwork/applying-eu-law/infringements-proceedings/infringement_decisions/index.cfm?lang_code=EN&typeOfSearch=false&active_only=0&noncom=0&r_dossier=&decision_date_from=&decision_date_to=&EM=BE&DG=ENV&title=&submit=Search.

²⁴ Case C-221/03 *Commission v. Belgium*, EU:C:2005:573.

²⁵ Germany has failed to effectively deal with the nitrates pollution and to revise its current legislation so as to make it compliant with the Nitrates Directive. See European Commission, 'Water: Commission refers GERMANY to the Court of Justice of the EU over water pollution caused by nitrates' *Press Release* (2016), https://ec.europa.eu/commission/presscorner/detail/HU/IP_16_1453; European Commission, 'Infringement Decisions' *European Commission as work*, https://ec.europa.eu/atwork/applying-eu-law/infringements-proceedings/infringement_decisions/index.cfm?lang_code=EN&typeOfSearch=false&active_only=0&noncom=0&r_dossier=&decision_date_from=&decision_date_to=&EM=DE&DG=ENV&title=&submit=Search.

²⁶ Case C-543/16 *Commission v. Germany*, EU:C:2018:481; European Anglers Alliance, 'Germany violates the Nitrates Directive - EU Court ruling' (2018), <https://www.eaa-europe.org/news/12638/germany-violates-the-nitrates-directive-eu-court-ruling.html#:~:text=On%20the%201st%20of%20June,of%20manure%20as%20a%20fertiliser>.

²⁷ F. Schulz, 'Germany may have to pay €850,000 per day for exceeding EU nitrate levels' *EURACTIV* (2019), <https://www.euractiv.com/section/agriculture-food/news/germany-may-have-to-pay-e850000-per-day-for-exceeding-eu-nitrate-levels/>.

²⁹ Germany has failed to designate numerous sites as Special Areas of Conservation. Additionally, its conservation objectives are not sufficiently quantified, measurable and reportable. See European Commission, 'Nature protection: Commission decides to refer GERMANY to the European Court of Justice over failure to properly implement the Habitats Directive' *Press Release* (2021), https://ec.europa.eu/commission/presscorner/detail/en/IP_21_412.

	in relation to the harbour porpoise. ²⁸		
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The table above provides an overview of the infringement procedures relating to the Nitrates and Habitats Directives. When it comes to the Nitrates Directive, all three relevant countries appear to have issues with its application. It can be seen that, in Belgium, this was the case for a specific region: Wallonia. This region had badly implemented the Directive, leading to shortcomings regarding the prevention of water pollution from nitrates. Similarly, the European Commission referred Germany to the Court of Justice of the European Union, again for having failed to put in place stronger measures against water pollution.

The situation does not differ substantially when comparing the infringement procedures initiated in relation to the Nitrates Directive to the ones initiated in relation to the Habitats Directive. As can be seen from the table, both the Netherlands and Germany have struggled with the proper implementation of the Habitats Directive.

A more general remark in relation to infringement procedures is that judgments often come too late. This means that the damage has already been done, with the exception of the scenarios in which interim measures are requested.³⁰ The problem is that these faulty and insufficient implementations in the various countries/regions cause doubts about the effectiveness of the Directives themselves. In relation to this dossier, it will be argued that a common/more harmonized approach is of great importance as nitrogen emissions cross borders. Eventually, such a common approach is unlikely though, as can be inferred from the examples set by these three countries.

1.2 Dutch policy

In 2019, the *Raad van State* (Council of State), the highest administrative court of the Netherlands, issued two rulings that were of great consequence for the Dutch nitrogen policies.³¹ In its first ruling, it held that the evaluation framework of the Dutch *Programma Aanpak Stikstof*, (PAS) (Dutch Programmatic Approach to Nitrogen) did not meet the requirements as laid out in the Habitat Directive (1991), Article 6, Paragraph 3 as implemented in Dutch law with the *Natuurbeschermingswet* (Nature Protection Act) of 1998. This judgement was based on a referral of the court's question to the Court of Justice of the European Union.³² In the second case, the possibility to give advance permission for certain economic activities within the Dutch PAS was challenged in court. In this specific case – about

²⁸ Information about the Netherlands and infringement procedures can be found here: European Commission, 'Infringement Decisions' *European Commission as work*, https://ec.europa.eu/atwork/applying-eu-law/infringements-proceedings/infringement_decisions/index.cfm?lang_code=EN&typeOfSearch=false&active_only=0&noncom=0&r_dossier=&decision_date_from=&decision_date_to=&EM=NL&DG=ENV&title=&submit=Search. In 2012, the Netherlands had issues in relation to the Habitats Directive since it failed to stop the deterioration of a Natura 2000 area.

³⁰ H. Schoukens, 'The Habitats Directive in the case law of the CJEU' *JUDICIAL TRAINING ON EU ENVIRONMENTAL LAW* (2019), https://www.eijn.eu/PageFiles/17863/Habitat%20Directive_Presentation.pdf.

³¹ Raad van State, 'PAS mag niet als toestemmingsbasis voor activiteiten worden gebruikt' ('PAS may not be used as a basis for consent for activities') (2019) <https://www.raadvanstate.nl/stikstof/@115651/pas-mag/>.

³² Raad van State, 'Uitspraak 201600614/3/R2, 201600617/3/R2, 201600618/3/R2, 201600620/3/R2, 201600622/4/R2, 201600630/3/R2' ('Statement 201600614/3/R2, 201600617/3/R2, 201600618/3/R2, 201600620/3/R2, 201600622/4/R2, 201600630/3/R2') (2019) ECLI:NL:RVS:2019:1603, <https://www.raadvanstate.nl/@115602/201600614-3-r2/>.

derogation of the permitting requirement for animal husbandry in the vicinity of Natura 2000 areas – the *Raad van State* ruled that the Habitat Directive (1991), Article 6, Paragraphs 2 and 3 requires the issuing of permits.³³ These two rulings meant that the Dutch nitrogen policy needed to be reformed, requiring the creation of new policies.

1.2.1 The *Wet Stikstofreductie en Natuurverbetering* (Nitrogen reduction and Nature Improvement Act)

In force since 1 July 2021, this law aims to reduce nitrogen deposition and thus to support the restoration and conservation of habitats. The law describes the following environmental values: 1) By 2025, the nitrogen deposition must be below the KDW in 40 percent of the areas containing nitrogen-sensitive habitats within Natura 2000 areas; based on current insights, this requires a nationwide average emission reduction of 10-15 percent, 2) By 2030, the nitrogen deposition must be below the KDW in 50 percent of the areas containing nitrogen-sensitive habitats within Natura 2000 areas; based on current insights, this requires a nationwide average emission reduction of 26 percent, 3) In 2035, the nitrogen deposition must be below the KDW in 74 percent of the areas containing nitrogen-sensitive habitats within Natura 2000 areas; based on current insights, this requires a nationwide average emission reduction of 50 percent.³⁴

1.2.2 The *Programma Stikstofreductie en Natuurverbetering* (Programme for Nitrogen reduction and Nature Improvement)

This programme is the tool developed to achieve these now legally binding nitrogen-reduction and nature-restoration goals and is formulated by the State and the provinces. The programme outlines how to strengthen the cohesiveness between the different measures, sets concrete milestones, describes how to monitor the results per area and how to redirect if deemed necessary. These goals are based on the EU Birds Directive (2009/147/EC) and Habitats Directive (92/43/EEC). They aim to limit the KDW in the Natura 2000 areas and thus protect the endangered species. The programme focuses on an integral approach to ensure that these measures together achieve the targeted effects on and for the long-term in Natura 2000 areas.³⁵

³³ Raad van State, 'Uitspraak 201506170/2/R2, 201506807/4/R2, 201506815/3/R2 en 201506818/3/R2' ('Statement 201506170/2/R2, 201506807/4/R2, 201506815/3/R2 en 201506818/3/R2') (2019) ECLI:NL:RVS:2019:1604, <https://www.raadvanstate.nl/@115590/201506170-2-r2/>.

³⁴ Ministerie van Landbouw, Natuur en Voedselkwaliteit, 'Programma Stikstofreductie en Natuurverbetering, Uitgangspunten, contouren en vervolgstappen richtingontwerpprogramma' (Contour memorandum on the Nitrogen-Reduction and Nature-Improvement Programme) *Rijksoverheid* (2021) <https://www.rijksoverheid.nl/documenten/kamerstukken/2021/07/16/contourennota-programma-stikstofreductie-en-natuurverbetering>.

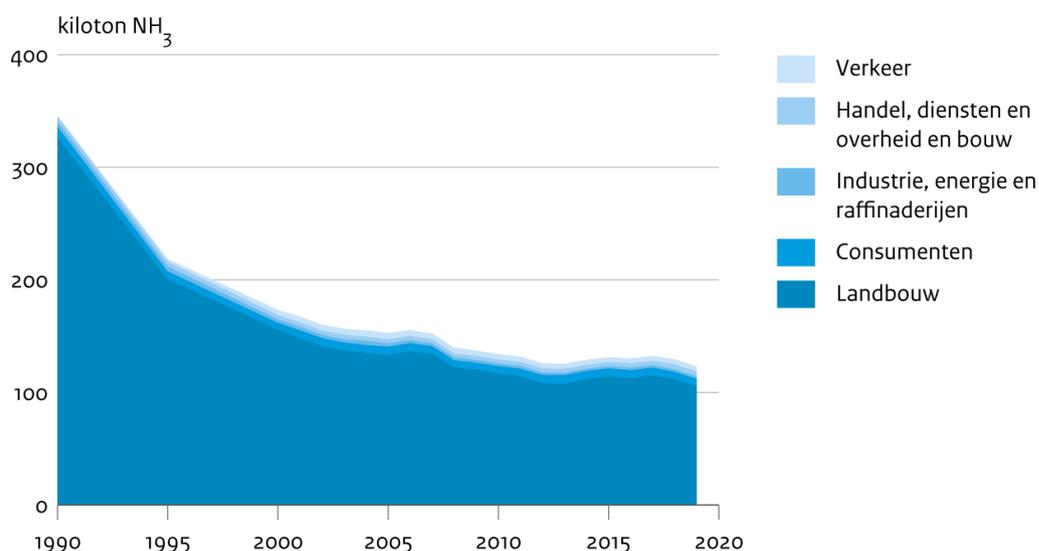
³⁵ Ibid.; Aanpak Stikstof, 'De stikstofaanpak' (The Nitrogen Approach) <https://www.aanpakstikstof.nl/de-stikstofaanpak>.

2. Geographical and sectoral demarcations

Evidently, nitrogen emissions have repercussions not only at national level, but are also part of a global issue: such emissions cannot be contained within national borders. If the effects of nitrogen emissions cross borders, measures ought to be implemented at supranational level to limit nitrogen emissions. Because national policies do not sufficiently take cross-border issues into consideration, the result is a lack of (data on) cross-border governance and collaboration on these issues, and the effects thereof on the themes of European integration, socio-economic and sustainable development, and European cohesion. This lack of Euregional data makes overall assessment of a national policy harder. By studying the Euregion Meuse-Rhine, this dossier aims to offer initial insights into the effects that the implementation of the new Dutch policy may have on a cross-border region regarding these three themes.

To delineate this research, we considered the four sectors that the Dutch nitrogen policy targets: agriculture, traffic, industry and construction. For the purpose of clarity and concision, and due to the fact that the agricultural sector is the main contributor to nitrogen emissions in the Netherlands (see Figure 2), the main focus will be on agriculture.

Emissie ammoniak (NH₃) per sector



Bron: Emissieregistratie

RIVM/feb21
www.clo.nl/nl018326

Figure 2: Ammonia emissions in the Netherlands per sector 1990-2019. Obtained from: RIVM ([Stikstof | RIVM](#)). Legend from top to bottom: Traffic; Trade, Services, Government and Construction; Industry, Energy and Refineries; Consumers; Agriculture.

First, when it comes to agricultural concerns, water streams/ rivers (e.g. Meuse) and groundwater cross borders, pollution coming along with this movement. If water pollution flows from one country to another (mostly in northern direction), the effects of using too many pesticides and fertilisers will

be felt on the other side of the border, even if the legislation is stricter there. Also, if bordering regions fail to implement similarly coercive measures, there is a risk for the effects to be marginal as long as pollution on one side of the border continues. Consequently, although the Netherlands is making efforts in this regard, these efforts may not be perceivable on its territory due to the pollution taking place upstream.

Secondly, 43,000 workers commute everyday across the Dutch, Belgian and German borders in the Euregio Meuse-Rhine,³⁶ causing additional nitrogen pollution in the Netherlands. This has been targeted in part by the Dutch policy of reducing the speed on highways from 130 to 100. However, Germany has no speed limit on highways, so that a proportion of these nitrogen emissions still crosses the Dutch borders. This makes the national efforts only partially successful in tackling the nitrogen emissions coming from traffic.

Finally, related to commuting, the construction sector: the more people live in a border area, the more housing is needed within that region. This creates additional nitrogen emissions in the Netherlands, even if they originate from outside the Netherlands. Furthermore, it is becoming more and more expensive to live in the Netherlands, which may increase the number of commuters from Belgium and Germany. As such, this is related to the problem mentioned in the previous paragraph.

Drawing from these three criteria, the Meuse-Rhine region will enable us to assess the global impact of the Dutch nitrogen policy. This specific approach has been chosen because the combination of these regions will allow for a more inclusive and wide-ranging discussion on the matter of Nitrogen emissions.

Encompassing 3.9 million people, divided into Dutch and Belgian Limburg, the Province of Liège and the region of Aachen, this is a region bustling with opportunities and thus attracting workers. Meanwhile, the region is also still very agricultural, thus encompassing all the sources of pollution targeted by the Dutch nitrogen policy. In addition, it has defined very clear areas for potential cooperation,³⁷ one of which is environmental health. Our research fits into the areas for collaboration targeted by the Euroregion. In light of the above, we have chosen to base our research on the Meuse-Rhein region.

As can be seen in Figure 3, the Euregio Meuse-Rhine consists of parts of the Netherlands, Flanders, Wallonia, and North-Rhine Westphalia.

³⁶ World Health Organization, 'Meuse-Rhine Euroregion' (2018)
https://www.euro.who.int/data/assets/pdf_file/0008/373157/rhn-meuse-rhine-eng.pdf

³⁷ Ibid.

Administrative Gliederung – Administratieve indeling – Division administrative



Figure 3. Map of the Euregion Meuse-Rhine. Obtained from: Limburg Stikstof Dashboard (<https://prvlimburg.maps.arcgis.com/apps/MapSeries/index.html?appid=0a819f0c3bb54b88b535d15036d859d5>)

3. The Research Themes, Principles, Benchmarks, and Indicators of the Dossier

This dossier aims to cover the three themes of European integration, sustainable and socio-economic development, and Euregional cohesion – because the issue of nitrogen emissions, as well as the Dutch policy to reduce them, appear to touch upon all of these areas. In addition to this, all three themes will prove relevant for the demarcations outlined above, as will be explained below. Since the Dutch approach follows the Habitats Directive,³⁸ this raises questions within the selected Euregion (see Table 1). As mentioned above, agriculture forms a major part of this research. Evidently, social and economic cross-border repercussions become relevant. The table below provides the principles, benchmarks and indicators relating to each of the themes studied in this Dossier.

Theme	Principles	Benchmarks	Indicator
European Integration	<p>European Union:</p> <p>Nitrates Directive: Protection of water quality from pollution by agricultural sources</p> <p>Birds Directive and Habitats Directive: Ensuring the conservation of threatened and rare species</p> <p>Article 18 TFEU: non-discrimination/ equal treatment</p> <p>Free movement (goods, persons, services)</p> <p>Cross-border economic activities</p>	<p>Contribution of the Dutch policy to compliance with EU directives</p> <p>Comparison of the Dutch compliance record with compliance in DE/BE, including the approach of neighbours DE/BE</p> <p>Does it have effects on cross-border flows in terms of the free movement of goods, persons, businesses, and equal treatment?</p>	<p>Quantitative: Compare regional/national emissions</p> <ul style="list-style-type: none"> - Nitrogen Emissions - Infringement procedures <p>Qualitative:</p> <ul style="list-style-type: none"> - Qualitative differences of the Dutch approach compared to its neighbours - Expectations: will the Dutch approach tackle the infringement problem?
Sustainable development/ socio-economic development	<p>European Union:</p> <p>Environmental Protection:</p> <p>Nitrates Directive Birds Directive</p> <p>Habitats Directive</p>	<p>No environmental deterioration due to farming practices (aim of national and EU legislation, covered above)</p> <ul style="list-style-type: none"> - Dutch economic objectives with respect to the farming sector under the new nitrogen approach - No distortion of competition in border 	<p>Quantitative :</p> <ul style="list-style-type: none"> - Impact of the new approach on the number of farmers in the Dutch part of the Euregion. How many farmers in the neighbouring regions are hit by new nitrogen obligations?

³⁸ Aanpak Stikstof, 'De stikstofaanpak' <https://www.aanpakstikstof.nl/de-stikstofaanpak>.

	<p>Article 11 TFEU: Sustainable development</p> <p>Objectives Euregion Meuse-Rhine - Nature conservation</p>	<p>regions due to national approaches</p> <p>- Sustainable farming in the Euregion Meuse-Rhine contributing to economic growth and employment, in line with nature conservation</p>	<p>Comparison of subsidy schemes in NL/BE/DE</p> <ul style="list-style-type: none"> - Comparison of financial incentives to close down - Land prices across the borders/incentives to cross the border? <p>State of cross-border natural sites</p> <p>Qualitative:</p> <ul style="list-style-type: none"> - Farmers' response to the implementation of the new Dutch policy - Expected reduction in economic activities in the Euregion due to the Dutch policy
Euregional Cohesion	<p>Sound cross-border cooperation in the agriculture sector – by regional authorities</p> <p>Potential for cross-border farming activities by farmers</p> <p>Active cross-border cooperation in the field of environmental protection and nature conservation</p> <p>Article 175 TFEU : Social, economic and territorial cohesion</p>	<p>The functioning of Euregional farming now compared to the situation before the implementation of the new Dutch policy</p> <p>The status of farming and cross-border collaboration in areas where the nitrogen policy has been compliant with the EU Directives</p>	<p>Qualitative:</p> <p>In which ways may the changes caused by the new Dutch policy hinder or promote cross-border interaction/cooperation?</p> <p>The quality of the cross-border relationships/collaborations between farmers in the Euregion</p> <p>The presence or absence of cross-border nature conservation projects</p> <p>The role of agriculture and environmental protection in Euregional mindset</p>

Table 1. Benchmarks

4. View of Euregional stakeholders

This section discusses the potential cross-border effects of the new Dutch policy on reducing nitrogen emissions per region within the Euregion Meuse-Rhein. The findings are based on reviews of the available relevant literature and documents, as well as interviews with various stakeholders.

Figure 4 shows that the NOx emissions have decreased in Belgium, Germany, and the Netherlands since 1990. However, the Figure also shows that, even though the NOx emission concentration remains higher in Germany, the overall reduction has been of substantially greater size there than over the last 30 years in Belgium and the Netherlands. Especially in the Netherlands, the nitrogen oxides emission concentration has remained quite stable over the years, which also shows the urgency of a new policy approach on nitrogen reduction.

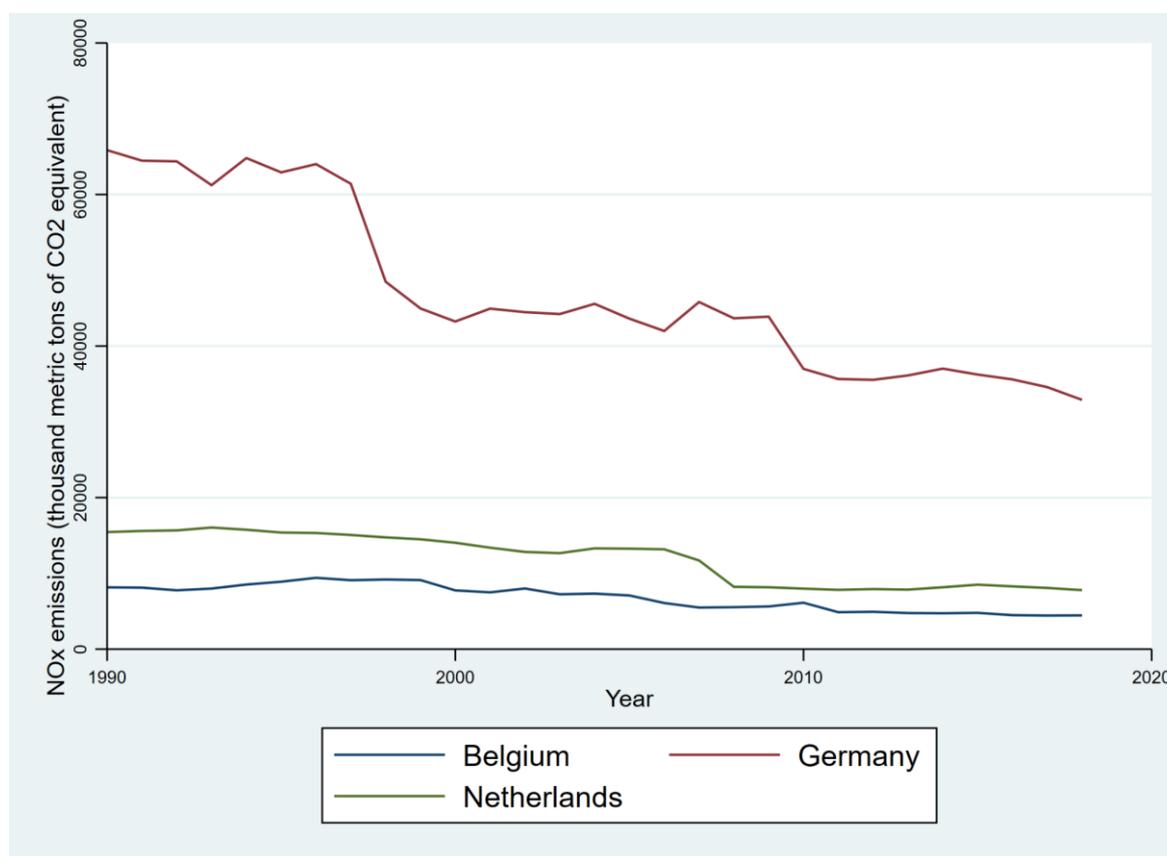


Figure 4: Total nitrogen oxide emissions in Belgium, the Netherlands and Germany, 1990-2019. Data obtained from VMM (www.vmm.be/data), CLO (<https://www.clo.nl/indicatoren/nl0189-stikstofdepositie>) and World databank (<https://data.worldbank.org/>).

4.1 The Netherlands

4.1.1 European Integration

The new Dutch policy on nitrogen reduction is based on Article 6 of the EU Habitats Directive. According to interviewee 1, the aim of the Dutch policy is to monitor the KDW and the number of hectares that should score below the KDW. Furthermore, the legal regime is highly focussed on (the assessment of) new activities, particularly on what to do when an area is above the targeted KDW. However, due to this focus and since the KDW is exceeded in many areas, various parts of the sectors discussed above are being shut down in the Netherlands, while the spatial effects of new activities that generate additional emissions – however small – are huge (stretching across more than 100 km). Therefore, the policy basically prohibits the initiation of new activities that might increase deposition if the existing deposition value exceeds the KDW.

Consequently, as mentioned before, different sectors face substantial obstacles, such as the denial of new building permits in the construction sector or the forced choice between innovations or buyouts, particularly in the agricultural sector. Nevertheless, these sectors all continue to lobby for the continuation of their work. The interviewee from the Province of Limburg mentioned a lack of housing in the Netherlands, especially in the Randstad area, due to the nitrogen issues. Based on the Dutch nitrogen policy, the construction of houses can only resume in Gelderland once livestock farming has been reduced there. Thus, livestock farming for export purposes is holding back the construction of houses domestically, which constitutes a clash at the heart of society itself.

Interviewee 1 highlighted that these policies might even hinder the proper functioning of these sectors in certain areas in the long term as it is almost impossible to decrease emissions below the KDW. In part, this is due to the fact that nitrogen can travel across great distances before it deposits. This is exacerbated by the fact that the Netherlands ‘calculates’ most of its nitrogen deposition using a model called AERIUS, which has a margin of 70% and is therefore rather inaccurate in its findings. The legal and governmental frameworks require (almost conclusive) scientific evidence, which models, even as elaborate as AERIUS, cannot provide.

Interviewee 1 also mentioned that the distrust between the various stakeholders has decreased in such amounts in the Dutch dossier that people are unwilling and/or unable to change the course of the current approach. Therefore, it remains questionable whether the focus on the KDW as proposed by the Dutch government will actually help to achieve the restoration and conservation of the Natura 2000 areas. In part, this is attributable to a lack of action, but also to the fact that the KDW in Limburg consists to a great degree of nitrogen from abroad, even though Limburg still contributes more to its own and other countries’ nitrogen emissions and depositions than it receives from abroad, as underlined by interviewee 2. Interviewee 2 mentioned that there are many areas in Limburg which are very nitrogen sensitive, such as the Sint-Pietersberg and the Brunssummerheide.

According to interviewee 3, this focus on the KDW is not the solution, based on the same arguments provided by interviewee 1 regarding the effectiveness of how the KDW is currently used. Interviewee 3 mentioned that, on the German side of the border, there are few agricultural and industrial companies, except in the Ruhr-region; thus, if ammonia deposits there, it would have no severe consequences. Belgium and the Netherlands, however, are more densely populated, with more livestock than Germany. According to this interviewee, the ammonia carried into the Netherlands from abroad will make the new Dutch policy unattainable, as long as there is no specific Dutch policy for reducing this kind of nitrogen deposition. According to interviewee 3, the Dutch cabinet may become aware of this gap too and would want to discuss strategies with other countries. However, whether

new strategies will be developed on an international level will also depend on the level of urgency and priority felt by Brussels.

Interviewee 1 proposed the implementation of a threshold similar to the ones used in Germany and Denmark in addition to the existing KDW. In Germany, any activity that leads to a deposition of less than 0.3 kg nitrogen/hectare, which is equal to about 21 mol, is deemed to not have detrimental effects. However, the interviewee suggested that this threshold should be stricter than in Germany, for example 0,5 or 1 mol, to achieve the targeted KDW. According to this interviewee, these targets can be met if the threshold is applicable only when the previous year shows an actual decrease of the nitrogen deposition. If this prerequisite is met, it is proven that the (cumulative) application of the threshold, including the new activities allowed, have not led to an increase in nitrogen deposition. In this way, implementing the threshold would be a win-win situation for the sectors as well as for nature and, thus, for the Dutch government and society.

Interviewee 3 said that the choices made regarding (Dutch) policy and focal areas are not only based on the environment, but also on public health; that they focus more on the impact on humans than on nature. The interviewee said that it is still plausible that such policies will improve the status of the environment, but that this requires new agreements at European level. Interviewee 3 also believes that the Netherlands will not be able to retain all of its nature, but that the country must strive to save as much of it as possible. This interviewee said that there is a minimum nitrogen reduction that can be achieved by holding accountable and taking on the biggest polluters. Nevertheless, the interviewee mentioned that the Dutch policies should not only focus on agriculture, because those emissions – mainly consisting of ammonia – deposit closer to their source than others, such as nitrogen oxides. Interviewee 2 mentioned that it is most important that everyone contributes comparatively to achieve the targeted nitrogen reduction. This interviewee highlighted that there are provincial stakeholder meetings on the nitrogen policy and new insights, which include people from the agricultural, recreational, and industry sectors, as well as other entrepreneurs from the Limburg area.

However, interviewee 2 mentioned that, even though a large part of the nitrogen deposits comes from abroad, the largest contributor within Limburg, and the Netherlands as a whole (see Figure 2) is the agricultural sector, especially livestock farming. The interviewee said that this sector accounts for the local peaks in nitrogen deposits as part of the 'nitrogen blanket' (also known as 'background deposition') that covers Europe. Some of the measures by the Province of Limburg are aimed at thinning this blanket, while others seek to eliminate or at least shave off the peaks. In Limburg, the greatest reduction of nitrogen can be achieved in farms, according to interviewee 3.

4.1.2 Sustainable and socio-economic development

The approach taken by the Dutch government to reach the EU targets consist of various measures aimed at different sectors. According to interviewee 2, a large part of the nitrogen deposits at national level comes from abroad, while about 45% comes from domestic agriculture. This is considered a very sensitive topic, however, which gets a lot of pushback from the agricultural sector. The Ministry has asked the RIVM to calculate the size of the deposition by this sector and the amount of reduction needed at national level, which, according to the interviewee, is 40 kilotons of ammonia per year. The Dutch government wants to achieve half of this reduction through stricter measures for the agricultural sector, including manure, which leaves 20 kilotons for the provinces to reduce. In Limburg, a reduction of around 4 kilotons must be achieved, which, according to interviewee 2, corresponds to the closure of around 500 to 1000 animal farms, depending on their proximity to Natura 2000 areas.

There are multiple options for (the most polluting) farmers: the national termination settlement; buying out of farms by the province (for livestock farms close to Natura 2000 areas); financial aid to make their farms more sustainable using novel, sustainable techniques; *'extern salderen'* (i.e. taking over the nitrogen rights of companies that partly or entirely close their doors), a scheme coordinated and controlled by the provinces; or switching to extensive farming or *'kringlooplandbouw'* (circular agriculture) via the *'Omschakelprogramma'* – a programme consisting of various agreements and funds to aid farmers when switching to more sustainable low(er)-nitrogen production processes.³⁹ In addition, the national government and the provinces also provide coaches and organise regional meetings to inform farmers in person.⁴⁰

A closer look at the Dutch voluntary buyout scheme does raise important questions. One of these is whether the voluntary buyout scheme might constitute state aid. Article 107(1) TFEU provides for what constitutes state aid by setting out the criteria that need to be fulfilled. At first glance, it might be argued that certain characteristics of (what, in the article, is considered to be) state aid are present in the Dutch voluntary buyout scheme, including, for example, the use of state resources and the offering of an advantage to certain undertakings. In the specific event of the Dutch buyouts of hog farmers, the European Commission has stated that these buyouts were in accordance with EU state aid rules. It has been argued that the approach taken by the Commission to these buy-outs could indicate a willingness to allow more schemes relating to agriculture.⁴¹ Evidently, their purpose would be to ensure the protection of the environment through attempting to regulate the harmful effects of nitrogen compounds and, more importantly, ammonia. Based on this rationale of protecting the environment and containing the use of harmful substances, it could be argued that the buyouts as per this new approach are in compliance with EU state aid rules. If it can be argued that the Dutch voluntary buyouts do not constitute state aid, it could be further inferred that the Dutch government's intervention has not led to the distortion of competition, at least not from a 'state aid' point of view.

Besides the options provided by the government, there is another option farmers might take into consideration: relocation. According to interviewee 1, Dutch farmers used to relocate to Flanders a few years back, because of the less restrictive measures, the close proximity to family and the similarity in the language spoken there. However, to this interviewee's knowledge, relocation from the Netherlands to Flanders no longer takes place in such great numbers. Interviewee 2 also mentioned that a company from Noord-Brabant had relocated to Spain. Interviewee 3 believes that most farmers will either quit or move across the border if the cooperation with the government does not work out well. The same source mentioned that a number of farmers have already moved from Noord-Brabant to Wallonia and Germany because of the similar culture and mentality, the different agricultural policies, and the greater recognition and appreciation for their occupation there. It is said that people take a different view of food production in these two countries; that they have greater trust in, and a more positive attitude towards farming; and that, as a result, the government is also more accommodating to solving problems together. In the Netherlands and Flanders, the scales are tilting in the opposite direction, making farmers feel almost like criminals when exercising their occupation.

Regarding farm relocation, there are several aspects to take into account beforehand, such as the amount of land available, the country or area to move to, the culture and the language spoken there. Interviewee 1 highlights that the key aspect is the amount of land available for farming, so that it might

³⁹ Rijksoverheid, 'Maatregelen om stikstofprobleem op te lossen' (Measures to solve nitrogen problem), <https://www.rijksoverheid.nl/onderwerpen/aanpak-stikstof/maatregelen-om-stikstofprobleem-op-te-lossen>.

⁴⁰ Rijksoverheid, 'Maatregelen om stikstofprobleem op te lossen', <https://www.rijksoverheid.nl/onderwerpen/aanpak-stikstof/maatregelen-om-stikstofprobleem-op-te-lossen>.

⁴¹ G-M. van de Meent and R. Struijlaart, 'European Commission: 'Dutch plans to buy out pig farmers are in accordance with the EU rules on state aid'' *Loyens & Loeff* (2019), <https://www.loyensloeff.com/insights/news--events/news/european-commission-dutch-plans-to-buy-out-pig-farmers-are-in-accordance-with-the-eu-rules-on-state-aid/>.

make more sense to relocate across greater distances rather than just across the border. Farmers who want to farm more intensively should also factor in and compare the (nitrogen) policies of neighbouring countries with those in more remote ones such as Poland, Ukraine, the Czech Republic, or even Canada. Whether Dutch farmers will actually move just across the border and whether the fears in these neighbouring countries of this happening is justified are both interesting questions which cannot be answered with certainty at this point.

As mentioned, one of the measures proposed by the Dutch government is to make agriculture more sustainable. Currently, such measures and techniques are being tested in experimental farms to determine whether the ideas work in practice.⁴² However, interviewee 2 highlighted that the innovations used to improve sustainability, such as air-cleaning technology, have yet to reach the targeted effectiveness.

Sustainable (and socio-economic) development was also discussed from a different perspective, namely regarding improving the balance between living and working and the relationship between rural and urban areas. Interviewee 2 mentioned that the Netherlands is the second largest exporter of agricultural products, but that we have to question, as a society, whether we still want to have this status, given the crises we are currently dealing with, including the COVID-19 health crisis and the climate crisis. The interviewee proposed the option of farming at a regional level, providing the products needed in the areas where the farms are located, rather than farming for export to other countries. This approach would be more sustainable as consumers would be getting local products, and they would know where their food comes from. This would, in turn, improve the relationships between rural and urban areas and might also restore the balance with nature as the farmers would need less livestock, and maybe even less land, to provide for their customers. The interviewee mentioned that there are different options to restore the environment in Limburg, such as de-intensifying agriculture and/or providing farmers with other business models, but also, for example, developing/creating nature areas which can retain water better. In the end, the approach will be decided at the provincial and national levels.

Interviewee 3 also discussed the influence of the consumer on sustainable farming, but rather taking the perspective of animal welfare, whereby more animal welfare means that more land is needed for the animals to live on. However, the interviewee said that this would also cause more nitrogen emissions, forcing consumers – and thus farmers – to choose between sustainability or animal welfare, because, in the end, the consumer has to pay for the product. However, one could ask whether animal welfare might also be achieved by reducing the number of animals to create more space.

The same interviewee said that consumers often prefer cheap meat over sustainability and animal welfare. The interviewee underlined that, based on nitrogen emissions, creating more outdoor space for animals is not feasible but larger stables are. The interviewee discussed how Dutch society is leaning more and more towards eating less meat, but that growing more other food will also increase the need for manure as plants also need nutrients. The interviewee's organisation therefore calls for a switch towards '*kringlooplandbouw*' (circular agriculture).

⁴² Rijksoverheid, 'Maatregelen om stikstofprobleem op te lossen', <https://www.rijksoverheid.nl/onderwerpen/aanpak-stikstof/maatregelen-om-stikstofprobleem-op-te-lossen>.

4.1.3 Euregional cohesion

Interviewee 1 was an advisor to the Flemish government after juridical statements that the Flemish nitrogen policy was inadequate to achieve the nitrogen targets. He stated that during this employment relationship, there was little or no collaboration with the Netherlands and that these meetings were rather unsubstantial at the time. From statement by interviewee 2, we can derive that this collaboration has been strengthened since then, as the province of Limburg claims to be holding meetings with Flanders. One of the outcomes of these meetings has been the development of a plan to conduct a pilot in the border area, whereby both sides will measure the nitrogen concentrations and then compare their nitrogen data to decide which areas jointly to focus on for nitrogen reduction.

Interviewee 2 stated that there has been some initial contact with the German partners as well, but that this cannot be compared to the collaboration with Flanders as Germany and the Netherlands are still figuring out the causes and interrelationships of their problems. Germany has a different problem than the Netherlands: the pollution of their ground water, which is thought to be caused by the manure from Limburg and other parts of the Netherlands. Interviewee 3 mentioned that they are collaborating with organisations in Germany.

There is also a conference for border areas, in which the Euregion Meuse-Rhine participates. The nitrogen issue will be discussed there, not as an agenda item but in relation to the need for further research, which is still in progress. Thus, although there is some synchronisation at cross-border level, every Member State continues to shape its own national policy and, causing the lack of cross-border harmonisation of nitrogen policies to persist.

Both interviewees 1 and 3 mentioned that this issue of unharmonized national approaches to the nitrogen crisis in the EU might be tackled through the implementation of an EU-wide regulation or collaboration. As interviewee 3 pointed out, the choices made regarding policies and priority focal areas are not only based on environmental concerns, but also take into consideration other issues, an important one being public health. This interviewee also stated that it is plausible that nature will be restored, provided that new agreements must be made at European level whose primary focus is the environment.

Interviewee 1 suggests the possibility to create larger areas – such as North-Western Europe – and to implement a single policy for these entire areas aimed at decreasing the nitrogen deposition and using an integral approach which, for instance, also focuses on climate policy. Under this policy, the foremost sector to focus on is the agricultural sector as it accounts for 70% of the nitrogen depositions. Interviewees 1, 2 and 3 all highlighted that a shift should take place towards a (high-tech) circular form of agriculture, of which interviewee 1 claims that studies have shown it can reduce nitrogen depositions. Achieving a nitrogen reduction of 50% will be relatively easy, he says. Going beyond that, however, towards achieving, for example, the EU target of 74%, would still be attainable but very expensive.⁴³ How to achieve this target should therefore be discussed at a higher level – for instance North-West Europe – with a focus on an integral approach and possibly supported through EU subsidies, given that this would imply a shift of focus away from individual national policies and issues towards decreasing the nitrogen blanket that covers all of Europe.

Another issue described by interviewee 1 is the fear and distrust among some jurists, ecologists and civil servants in some of the ministries, as well as the increasing ‘extremism’ within these groups, as the nitrogen emissions and deposition are not effectively decreasing. The PAS was declared illegal already in 2019, but the lack of action persists. The fact that the KDW can be measured is beneficial in this respect, in that governments can be held accountable for not meeting the KDW values in their territories. However, the KDW lacks efficiency in terms of meeting the EU targets, given that the 74% target will be very expensive to achieve, especially compared to the actual benefit this would have on the restoration and preservation of nature. After all, this is the reason Article 6 of the Habitats Directive was formulated in the first place, not just to reduce nitrogen depositions.

⁴³ Aanpak Stikstof, ‘Verkenning Normeren en beprijzen van stikstofemissies’ (Exploration Standardization and pricing of nitrogen emissions), <https://www.aanpakstikstof.nl/documenten/rapporten/2021/03/19/rapport-normeren-en-beprijzen-van-stikstofemissies>.

4.2 Wallonia

4.2.1 European integration criteria

The Walloon government started implementing its nitrogen regulation in 1995, following the 1991 EU nitrates directive. This regulation, the *Plan de Gestion durable de l'Azote* (PGDA – Sustainable Nitrogen Management Programme), is renewed every five years and updated with new objectives to be met before every next mandate period. Aware of the efforts involved, Wallonia offered financial encouragement and technical assistance to its farmers to meet the objectives.

The Walloon government implemented various measures to monitor and tackle the excess use of nitrogen in agriculture that will be elaborated on in the Sustainable and socio-economic section. These measures were implemented rather early, which made Wallonia a good example of early nitrogen tackling. Thanks to these efforts, they have been below the EU nitrogen emissions standards since the early 2000s, contrary to Flanders and the Netherlands. However, now that these two regions have drastically tightened their nitrogen-emissions regulations, Wallonia's rules are not as strict as the Flemish and the Dutch ones. According to an interviewee from the Walloon research Centre for Agriculture (CRA-W) (interviewee 4) and from the Walloon Public Service (SPW) (interviewee 5), there are fears that Dutch and Flemish farmers living close to the border will relocate to Wallonia to escape the drastic restrictions at home.

The main fear, according to interviewee 5, concerns pig and poultry farming, both of which are major contributors to nitrogen emissions. Recent legislation in which the Flemish government seeks to reduce the pig livestock by 30% in its region very specifically targets these sectors. Considering that Wallonia did not pass similar legislation, their fear regarding the influx of these types of livestock could have become reality. However, Wallonia passed another law which makes it very difficult for farmers to expand their business if the expansion is meant for pig and poultry farming (interviewee 5). Therefore, although it is not technically impossible to move one's business activities to Wallonia, it is very unlikely that this will happen. It is also noteworthy that this has not happened so far.

According to the SPW (interviewee 6), contacted by email on 2 May 2022, only 10 Dutch farmers owned land in Wallonia, all of whom had settled there before the implementation of the Dutch nitrogen policy in 2019. This interviewee also stated that a large influx of Dutch farmers into Wallonia was something they would closely monitor but did not expect to materialise due to the legislative constraints in Wallonia. From this, we may conclude that major relocations of Dutch farmers are unlikely to happen considering the legislative tools in place. Nevertheless, a massive relocation of Luxembourgish farmers took place around ten years ago when Luxembourg implemented stricter nitrogen measures. To date, 217 Luxembourgish farmers own land in Wallonia, according to interviewee 6. These farmers moved to Wallonia to expand at a cheaper price than in Luxembourg. Considering that their major motive for moving to Wallonia had to do with economical reasons, Dutch farmers are unlikely to repeat this mass movement today. After all, the economic argument does not hold for Dutch farmers, given the soaring farmland prices in Wallonia, which will be addressed in the next section.

4.2.2 Sustainable development/ Socio-economic development

As Wallonia is trying, through a number of nitrogen-reduction laws, to impose barriers for foreign farmers wanting to move to the region Walloon farmers also suffer the consequences of these

dissuasive policy measures. Indirectly, the tightening of the Dutch and Flemish legislations thus has had internal repercussions for Walloon farmers, in that it has become very difficult for these farmers to expand their existing farms to include livestock. To do so, they need to purchase more land, for which a permit is required. According to all Walloon interviewees, this permit is very difficult to obtain. The additional pressure on farmers to reduce their nitrogen emissions clashes with the economic viability of their business: To earn more, they need to intensify their production, which in turn leads to additional nitrogen emissions on the same hectares. Given the very strong monitoring of nitrogen emissions by the environmental section of the Walloon government, farmers cannot intensify their production as much as they need to, so they are forced to expand in order to obtain the additional nitrogen emissions rights. Wallonia is monitoring the emissions very closely through three main tools (interviewee 7):

- the annual monitoring of the concentration of nitrogen concentration in soils (*taux liaison-sol*), whereby each agricultural business cannot exceed a certain concentration of nitrogen per m³;
- the *suivi de l'azote potentiellement lessivable*, which identifies the remaining nitrogen in the soil to adapt the amounts of nitrogen intrants for the year n+ 1; and finally
- the implementation of a manure-spreading plan. According to this plan, organic fertilisers cannot be laid down all year long to avoid the leaching of nitrogen into water streams. This has to be done during specific periods when the ground is not frozen. This plan encourages farmers to inject the organic fertilisers directly into the soil, or possibly on top of the soil if deemed necessary. This contrasts with the traditional method, which consists of spreading these fertilisers by air, entailing additional nitrogen losses for farmers and additional nitrogen depositions in the environment.

Thanks to all these measures, the concentration of nitrogen in Walloon soil has significantly decreased over the past 25 years. The concentration of nitrogen dropped from 240 kg per hectare (ha) to 190 kg per ha, which is relatively low compared to other areas in the Meuse-Rhein region. The nitrogen levels in ground waters also dropped from 29 tonnes in 1995 to 16 tonnes in 2016. Note that the Dutch nitrogen policy did not have much of an effect on these aspects, however, given that Wallonia is upstream from the Dutch province of Limburg. Nevertheless, the environmental department of the Walloon region fears some practical repercussions of the Dutch nitrogen policy.

According to interviewee 4, the tightening of the nitrogen laws, the pressures from external farmers willing to move to Wallonia, and the speculation on farmlands have led to soaring farmland prices and subsequently have caused the purchasing power of Walloon farmers to drop. Although the Dutch nitrogen policy is not the only impacting factor, interviewee 7 told us that these dramatic price rises were taking place mostly in areas where the soil was very fertile, and at the borders with Flanders and the Netherlands. We could therefore conclude that the Dutch nitrogen policy has contributed to the skyrocketing of farmland prices in Wallonia. However, Wallonia will make it very difficult for foreign farmers to move there as that would jeopardise the efforts the region has made over the past years to reduce its nitrogen emissions (interviewee 4).

Between 1990 and 2015, azote fertiliser consumption by farmers decreased by 21% from 240kg to 190 kg per ha, while the NH₃ emissions (mostly coming from agriculture) decreased by 17%⁴⁴. This is relatively consistent as NH₃ particles have a tendency to fall back to the ground close to where they

44 Walloon Public Service (2020). Bilan et évolution de la qualité des eaux et des pratiques agricoles en Wallonie (Summary and evolution of the groundwater quality and agricultural practices in Wallonia)

were emitted. When it comes to NO_x, further research is needed. The reduction of nitrogen emissions in Wallonia therefore has a direct impact on air quality. However, 60% of NH₃ and 80% of NO_x pollution in Wallonia comes from outside the Walloon borders, and contrary to soil pollution, these numbers have barely decreased over the past 20 years. Although no specific data has been found on the geographical origins of this pollution, the Netherlands are very likely to play an important role in the exportation of their nitrogen air pollutions and to the winds (interviewee 7). Thus, due to the region's proximity to the Netherlands and the numerous farming areas near its border, the implementation of the Dutch nitrogen policy is very likely to improve the situation in Wallonia even further. This suggests that, although Wallonia is doing efforts to limit its nitrogen emissions, only part of that task can be achieved at national level. However, the reductions in NO_x and NH₃ emissions over the past 25 years demonstrate the great impact of the Walloon measures on nitrogen emissions.

4.2.3 Euregional cohesion

Cooperation between Wallonia and the bordering regions on tackling nitrogen emissions is already taking place at different levels. The France-Wallonie-Vlaanderen interreg is currently working on a project to promote more sustainable agricultural practices, including the reduction of nitrogen intrants. The Transae project aims at making agriculture more environmentally friendly by implementing several new agricultural practices, such as the rotating culture on farmlands to reduce the need for nitrogen intrants, which in turn reduces nitrogen pollution in the soil, the water streams and the atmosphere. In order to achieve this, they are testing different methods to enrich the soil in nitrogen without using intrants. Planting companion plants such as field bean or lentils fodder are examples of techniques used to reduce the need for organic fertilisers. Although this initiative is purely French and Belgian, one of our interviewees (interviewee 4) assured us that this type of practice could very well be implemented on another interreg (such as the Euregion Meuse-Rhein). Furthermore, the Netherlands is part of the international *Divers Impact* project, which supports sustainable agricultural practices across Europe. Dutch farmers have, for example, been influential in promoting strip cropping. This technique consists of planting bushes in certain parts of the field to favour the development of biodiversity. In turn, this will add nitrogen in the soil. The Netherlands is therefore committed to cooperating at international level to reduce its need for nitrogen fertilisers. Nevertheless, according to interviewee 4), the Dutch agricultural structures do not favour implementation on a wide scale. Although hardly applicable on a wide scale in the Netherlands, the Euregion Meuse-Rhein could spark cooperation on this topic.

Wallonia also collaborates with Luxembourg as many Luxembourgish farmers have moved to Belgium over the past two decades to expand their farms. This cooperation is much more institutional and is not specifically targeted on nitrogen issues. However, said joint operation helped Wallonia to manage and monitor the cross-border movement of farmers. Combining this administrative collaboration with the much more practical cooperation in the Meuse-Rhine region would constitute a solid basis for further reducing the nitrogen emissions at regional level.

4.2.4 Discussion

The effect of the new Dutch nitrogen Policy on Wallonia has so far been limited. There is no evidence of a direct impact, be it positive or negative, on the Walloon region. Nevertheless, some effects are expected to take place. Considering the proximity of The Netherlands to Wallonia and the less constraining environmental laws in the Belgian region, it is feared that some Dutch farmers will move to Wallonia in the near future. However, this is not happening yet as only 10 Dutch farmers are currently registered in Wallonia according to interviewee 6. Moreover, Wallonia started to implement several constraining laws that make it harder for farmers – whether Belgian, Dutch or of any other

nationality – to start a farming practice that emits excessive amounts of ammonia. As such, a massive relocation of Dutch farmers to Wallonia is unlikely to happen.

While this very direct impact is unlikely to occur, there are more indirect impacts constraining Walloon farmers: Due to the high demand for land in Wallonia, both in the fertile areas and at the Flemish and Dutch borders, there has been speculation on these lands. This leads to an unprecedented soaring of the price per hectare. Although the Dutch nitrogen policy is not the only explanatory factor for this, it has definitely had an impact according to interviewee 4.

4.3 Flanders

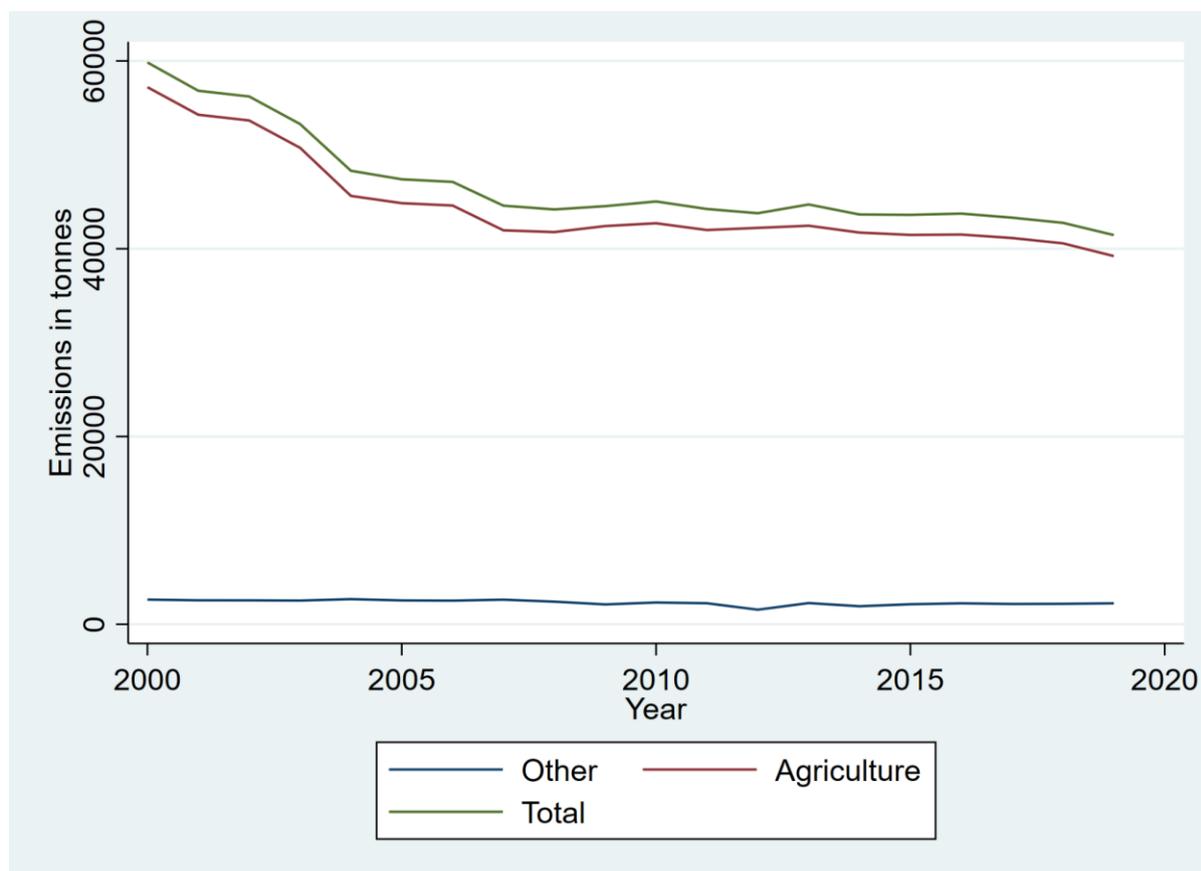


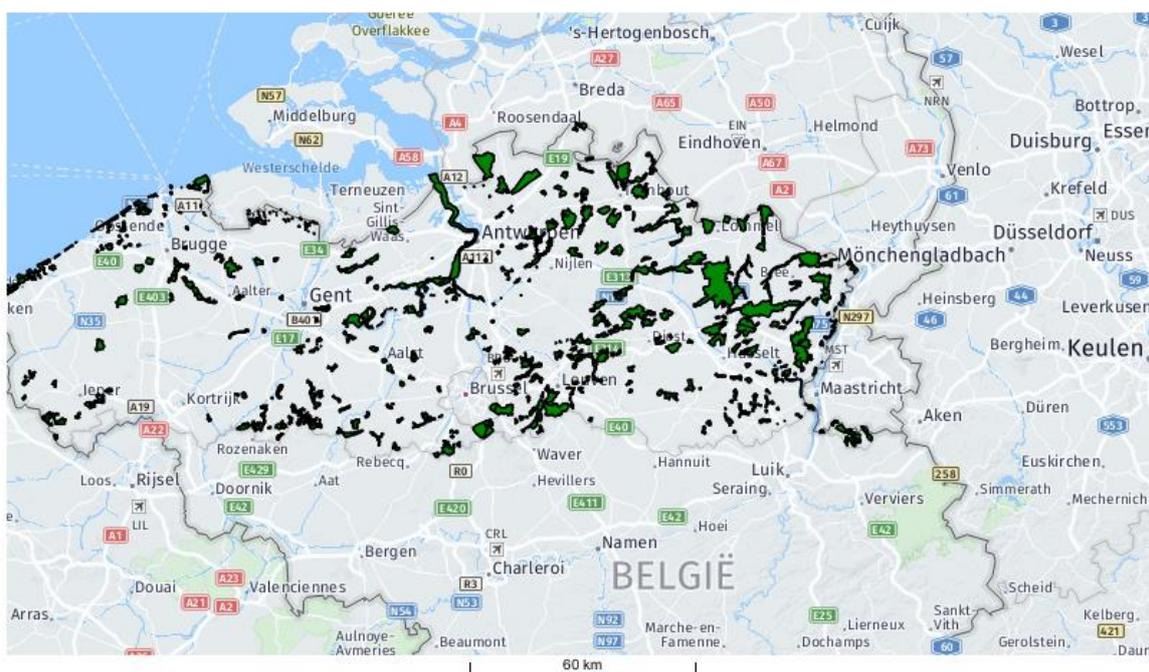
Figure 5: Ammonia (NH3) emissions in Flanders, 2000-2019. Data obtained from VMM (www.vmm.be/data)

4.3.1 European Integration

The Flemish Region, like the Walloon Region, started making policy on nitrogen emissions as a consequence of the Bird and Habitat Directives. The preparatory work for the Bird Directive started in 1981, when a number of Government institutions and agencies were tasked with formulating a policy proposal on the transposition of this directive. In 1988 the Flemish Government earmarked the Bird Directive Areas in conformity with the guidelines in the Directive. These areas were designated based

on the presence of the bird species mentioned in annex IV of the *Natuurdecreet* (Nature Decree) as well as a number of migratory bird species that frequent Flanders.⁴⁵ Similarly, regarding the Habitat Directive, the Flemish Government decided to designate a number of areas in Flanders as SBZ-H (Special Protection Zones) in 1996. The European Commission judged that this proposal was inadequate. In 2001 the Flemish Government expanded the original proposal with additional areas and turned it into an official decision by the Government, which was approved by the European Commission in 2004.⁴⁶ The map in Figure 6 provides an overview of the current Natura 2000 areas in Flanders. As can be seen on this map, there are a number of Natura 2000 areas on the border regions of the southern Dutch provinces of Zeeland, Noord-Brabant and Limburg. This further underscores the interconnectedness of the nitrogen issues in Flanders and the Netherlands.

Geopunt-kaart



Bron: www.geopunt.be

19/05/2022

1

Figure 6: Map of Natura 2000 areas in Flanders. Obtained from Geopunt (Kaart | Geopunt Vlaanderen)

4.3.2 Sustainable development/ Socio-economic development

In our interview with the Flemish *Departement Landbouw en Visserij* (Department of Agriculture and Fisheries) (interviewee 8), they explained that the Flemish Government started to take the first serious measures on manure production in the 1990s. Initially this took the form of ensuring that manure be stored in a covered storage unit. In 2004, the Government drew up a list of low-emission stable systems. It was made compulsory to use one of the systems from the list when building new stables for livestock. The interviewee surmised that the motivation behind this was the NEC's (National Emissions Ceilings) having to be met. Between 2014 and 2016, the Flemish government quickly put together a provisional PAS (Programmatic Approach

⁴⁵ VLAANDEREN.be, 'Vogelrichtlijngebieden, (Birds Directive Areas) NATURA 2000', <https://natuura2000.vlaanderen.be/vogelrichtlijngebieden>.

⁴⁶ VLAANDEREN.be, 'Habitatrichtlijngebieden, NATURA 2000', <https://natuura2000.vlaanderen.be/habitatrichtlijngebieden>.

Nitrogen). This policy categorised farming businesses according to their impact scores. An impact score of 5% or less resulted in a green letter, a score between 5% and 50% in an orange letter and above 50% in a red letter. The businesses with red letters were ordered to wind down their businesses by the end of their permit's runtime. The firms with orange letters faced all sorts of restrictions, while those with green letters could not increase their emissions beyond their current levels. The interviewee stated that, soon after the PAS was formulated, it was discovered that these measures would not be sufficient to reach the goals set in the Directive. They told us that, regardless of this, the issue was relegated to the background.

The ammonia emission data (see Figure 3) show that there indeed was a decline in the early 2000s. However, in the same graph, it can also be observed that there is a stagnation in the decline of these emissions. This stagnation was corroborated by our interviewees at the ILVO (Flanders Research Institute for Agriculture, Fisheries and Food) (interviewee 9) and the VMM (Flemish Environment Agency) (interviewee 10). Our interviewee from the ILVO explained that part of this stagnation is due to the less ambitious targets for agriculture that were set in the *Luchtbeleidsplan* (Air Policy Plan) of 2019, which is overseen by the *Departement Omgeving* (Department of Environment). They explained that this lower ambition is due to the targets for ammonia emissions being set at too high values by a lot of EU Member States. Moreover, the agricultural sector faces a number of challenges that the other sectors in the economy do not face. Our interviewee explained that first, there is a lot of lobbying from stakeholders in this sector to tone down government ambitions. Secondly, the nature of farming makes it more difficult to reduce emissions. Farming is carried out within an open system with live animals and living soil. This makes it more difficult to adjust the parameters of the farming process.

According to interviewee 8 (Departement Landbouw en Visserij), the first signs of change in the nitrogen policy on farming was the Dutch PAS being struck down by a court. Then, in February 2021, the Flemish Government had a major wake-up call when a Flemish court issued a new ruling. In a court case about a poultry farm, the Flemish *Raad voor Vergunningsbetwistingen* (Council for Permit Disputes) struck down the Flemish PAS-framework as being insufficiently scientifically underpinned.⁴⁷ As a consequence of that, the Minister Zuhal Demir of Justice and Enforcement, Environment, Energy and Tourism issued a ministerial instruction to various Flemish Government agencies setting out the temporary guidelines for these agencies to use in order to make decisions and recommendations on the issuance of permits.⁴⁸ This ruling kick-started the drafting of new legislation. In February 2022 the Flemish came to an accord, the *Krokusakkoord*, which sets out new measures to curb nitrogen emissions. This accord is now in the stage of public consultation and will soon be turned into an official legislative framework.

Interviewee 8, Natuurpunt (interviewee 11 – a nature conservation association which manages a large number of nature reserves in Flanders) and interviewee 10 (VMM) explained that the *Krokusakkoord* is in the phase of public consultation and is intended to be turned into an official legal framework later in 2022. Changes in this new policy are of three types: First, additional measures for agriculture will be taken. Farming businesses which have an impact score greater than 50% will have to wind down already by 2025, and the threshold value for obtaining a green letter will be lowered from 5% to 0.1%. Moreover, the trade in emission rights (mainly for agriculture) will be reduced strongly. This trade previously contributed to the stagnation in the emission declines as it kept total legal emissions at the same level. These rights will only be transferable to a farming family's direct successors for two generations, but they will be forfeited if the business is sold or converted to another legal form. Similarly, the trading and processing of manure will be stopped too as it is sensitive to fraud and ultimately does not contribute to a decrease in emissions. The second type of change to the policies concerns nature restoration: the Government has made a large sum of money available for restorative measures in and around nature reserves. These restorations will, for example, be achieved by reversing abiotic conditions in the soil. The last major change to the PAS is the new permit policy; the new permit policy is much stricter, as agricultural firms are not allowed to exceed 0.025% of the KDW load in the vicinity of nature reserves. If the impact of a firm is below this number, permits may be granted. If the impact score is between 0.025% and 0.8%, a more detailed assessment of the effects of the business will be conducted to determine

⁴⁷ Raad voor Vergunningsbetwistingen Arrest, 'Van 25 februari 2021 met nummer RvVb-A-2021-0697 in de zaak met rolnummer 1920-RvVb-0151-A', https://www.dbr.be/sites/default/files/2021-08/RVVB.A.2021.0697_0.pdf.

⁴⁸ Vlaams minister van Justitie en Handhaving, Omgeving, Energie en Toerisme, 'Ministeriële instructie betreffende de beoordeling van de stikstofuitstoot van vergunningsaanvragen betreffende projecten of activiteiten met mogelijke betekenisvolle effecten op de habitatrictlijngebieden' (Ministerial Instruction) Vlaamse Regering, https://www.natuurenbos.be/sites/default/files/20210502_instructie_pas.pdf.

whether a permit can be granted. If a business has a higher impact score, a permit will not be granted. The new policy will be evaluated in a few years' time, with a possibility of relaxing the thresholds if emissions are low enough.

According to our interviewee from Natuurpunt (interviewee 11) and Departement Landbouw en Visserij (interviewee 8), the new policy has received mixed responses. The industry and transport sectors are positive because it mostly focuses on agriculture, as the policies for transport and industry have been laid down in the *Luchtbeleidsplan*. Farmer's unions, in contrast, show mixed responses. Boerenbond, a major organisation representing roughly 80% of Flemish farmers, is vehemently opposed to the new PAS. According to our interviewee from Natuurpunt (interviewee 11), they are conducting a media campaign to undermine the new PAS, for example by citing extreme cases such as the Averbode farm or a Natuurpunt farm. Conversely, smaller agricultural interest groups are mainly focused on getting clarity from the Flemish government on what the new policy is going to be. The organic farmers go even further and say that the new policy is insufficient, arguing that it should have put more emphasis on sustainable farming.

4.3.3 Euregional cohesion

According to our interview with the VMM (interviewee 10), there is some intergovernmental information exchange between the Flemish and Dutch national governments. Moreover, interviewee 11 stated that they sometimes have talks with their counterpart organisations in the Netherlands, such as *Natuurmonumenten* (Nature Monuments) and *Milieudefensie* (Environmental Defence). These exchanges are of an informal nature; there are no official contracts governing these exchanges in place. As far as we understood, there is no official governance framework involved in this exchange as of yet; it is mostly an endeavour to understand what the other party is doing. Some of the data exchanged pertains to the models used by both governments: FLOPS for Flanders and OPS for the Netherlands. In our interview with the Flemish research institute ILVO, we were told that they would like to see the deepening of the cooperation on the nitrogen issue. They proposed that the way to accomplish this is by harmonising the permit policies for farms. This is necessary because the pollution caused by Flemish agriculture spills over to the Netherlands and vice versa. As there are a number of Natura 2000 areas on both sides of the border, the interviewee argues that it is necessary to do so to constrain the impact of economic activities on nature reserves in either country.

In the legal area there have been some developments. The interviewee mentioned that there is a court case in which the Netherlands argued that a Flemish firm right on the border would have an adverse effect on Dutch nature. The interviewee from Natuurpunt (interviewee 11) pointed out an issue with the current situation: in the Netherlands, the calculations for the permits are conducted using mol as the unit. In Flanders by contrast it is calculated as a function of the percentage of the KDW which a sensitive habitat can tolerate without degrading. He argued that these differences in approaches will have to be reconciled first before a common policy becomes a possibility. The Natuurpunt representative (interviewee 11) in their interview furthermore mentioned some other areas in which the Netherlands and Flanders can cooperate. First, there should be some harmonisation on the requirement of the use of shore-based power for ships berthed in Flemish and Dutch ports in order to reduce nitrogen oxide emissions. They argue that, if these measures are taken unilaterally, they will simply move the problem as shipping companies will relocate operations to another port. Moreover, they argue that there should be Flemish-Dutch cooperation on traffic. Elements such as road pricing should be addressed together by both countries. Additionally, international cooperation is necessary to move road traffic to the railways, especially for the transport of goods. However, this brings its own unique set of challenges, the most important of which is that railway lines, due to years of neglect, are

now suddenly in the middle of a nature reserve. This happened, for example, to the Iron Rhine running from Belgium through the Netherlands to Germany. The representative from the Departement Landbouw en Visserij (interviewee 8) also mentioned that there is a possibility of making international policy on nitrogen emissions at Benelux level. That person mentioned that there is a Benelux treaty (they were unfortunately unable to specify which treaty) which would enable such cooperation.

Our interviewee from the Departement Landbouw en Visserij stated that new strict permit policy for agricultural businesses has led to a sharp reduction in the number of new farming businesses starting up in Flanders. According to them, they received signals (but no concrete data) that Dutch farmers were moving to Flanders and setting up new firms there. The Dutch research collective Spit and Flemish news magazine Apache researched this further. According to them, 45 Dutch agricultural businesses were operating in Flanders in 2021. However, it is unclear whether this number has been growing since the start of the nitrogen crisis in the Netherlands. Concrete data on this is not available.⁴⁹ Nonetheless, the interviewee from the Departement Landbouw en Visserij (interviewee 8) stated that the new permit policy has largely stopped this movement. However, they did note that Dutch farmers can still pursue the avenue of buying up existing farms. They also stated that the Dutch farmers more often than not own large-scale farms compared to the Flemish farmers.

4.3.4 Discussion

In our interviews with the people from the ILVO (interviewee 9), the Departement Landbouw en Visserij (interviewee 8), and Natuurpunt (interviewee 11) we learned that the Flemish, for the moment, have a positive opinion about the Dutch Nitrogen policies. This is due to the fact that the Dutch situation put the urgency of the nitrogen issue somewhat on the map for the Flemish Government. Moreover, a reduction of the nitrogen emissions would also reduce the amount of nitrogen that enters Flanders. The interviewee from ILVO (interviewee 9) did nuance this, stating that the dominant south-westerly wind does dampen the impact of Dutch efforts to reduce nitrogen emissions. The interviewee from the Departement Landbouw en Visserij (interviewee 8) raised the point that the Netherlands and Flanders have diverging goals for their nitrogen policies. The Flemish goal is to reduce the excess of the KDW by 50%. The Dutch contrarily seek to have improved the condition of 50% of its soil by 2030. The interviewee explained that this in theory could mean that the Netherlands could only focus on the central regions to achieve this goal. Thereby they could ignore the southern Netherlands, where a lot of animal husbandry is practiced. In sum, it can therefore be stated that the Dutch nitrogen policy has a rather limited impact on the state of the Flemish nitrogen issues.

4.4 Euregion Meuse-Rhine

4.4.1 European Integration

In an interview with interviewee 12, it was discussed that, at present, the Euregion's agenda is not focused on the nitrogen issue specifically. With regard to quantitative data and the assessment of how nitrogen emissions are spread throughout the Euregion Meuse-Rhine, it should be mentioned that no attempt has taken place to collect such data as yet. This has various reasons. Most importantly, since

⁴⁹ S. Vanden Bussche, 'Meer Nederlandse veehouders naar België sinds stikstofcrisis' (More Dutch livestock farmers to Belgium since the nitrogen crisis), *Apache* (2021), <https://www.apache.be/2021/05/28/meer-nederlandse-veehouders-naar-belgie-sinds-stikstofcrisis>.

methods of measurement may vary from region to region, it can be extremely hard to undertake such a process within a region that involves three countries: The Netherlands, Germany and Belgium.

Nevertheless, an important element to consider is that the Three Countries Park wishes to support the implementation of the European Landscape Convention, in an attempt to contribute to the sustainable development of the Euregion Meuse-Rhine.⁵⁰ Article 3 of the Convention provides that the purpose of the Convention is to ensure landscape protection, management and planning. Additionally, as the purpose of the Convention is twofold, its second aim is to arrange European co-operation in relation to landscape matters. The scope of the Convention is quite extensive, as can be seen from Article 2. Crucially, it covers natural, rural, urban and peri-urban areas. Lastly, the Convention sets out general and specific measures.

4.4.2 Sustainable development/Socio-economic development

Within the Dutch nitrogen approach, it appears that farmer buyouts might not be the most sustainable solution. Currently, more sustainable agriculture is considered within the Euregion, which appears to be a more beneficial and desirable option. A voluntary buyout scheme might not be able to ensure a sustainable approach in agriculture, and, evidently, the decision whether to accept the scheme is left to the farmers. Sustainable agriculture, on the other hand, would ensure that farmers could keep their jobs, and would, at the same time, mitigate the effects of this occupation. Consequently, a more sustainable approach might not impact employment, at least not in the agricultural sector.

Moreover, in relation to agriculture, the Euregion is aware that there might be farmer mobility between the borders. As regulations stand at the moment, it has been argued that the Netherlands has the strictest approach in place in relation to the nitrogen issue. As a result, this could lead to farmers' relocating to areas that are more lenient. A case in point is Flanders, which has a more lenient policy than the Netherlands. The region of Wallonia, however, takes an even softer approach than Flanders. As shown above, this could lead to further mobility of farmers between these regions.

4.4.3 Euregional Cohesion

When it comes to Euregional Cohesion, two arguments can be put forward: Firstly, as elaborated above, the possibility of taking a sustainable approach within the Euregion suggests that farmers might retain their occupation without having to relocate across the border. Additionally, a common sustainable approach within the Euregion could entail cooperation between the different constituent regions.

Secondly, the GIS portal with the relevant information for the Euregion Meuse-Rhine as well as the Three-Countries Park can be perceived as further instruments of cooperation.⁵¹ For example, obtaining all the relevant data and information for each region concerned could be seen as a sign of sharing and

⁵⁰ 3LP Partnership, 'Mission of 3LP', <https://www.drielandenpark.info/en/verbund-3lp/mission-vision/>.

⁵¹ StädteRegion Aachen, 'inkasPortal', <https://geoportal.staedtereion-aachen.de/?viewid=145&rw=301926.500&hw=5622632.000&scale=250000>.

collaboration. Taking this a step further, it might be argued that it could lead to further collaboration and information exchange between the EMR's constituent regions.

4.5 Germany - Nordrhein-Westfalen

4.5.1 European Integration

In Germany, reactive nitrogen emissions amount to around 4.2 million tonnes annually, and approximately 60% of these emissions originate in the agricultural sector. The country has made efforts to reduce nitrogen emissions and has succeeded in several sectors: manufacturing, energy industry, traffic and transport, wastewater management. However, Nitrogen reduction in the agricultural sector was not as successful. The *Umwelt Bundesamt* (UMB, German Federal Environment Agency) recommends setting the nitrogen-surplus target to 50 kg per hectare per year by 2040 to address the issue in the agricultural sector.

Germany has introduced the National Emission Ceiling Directive. It comprises a number of policies and measures additionally to reduce air pollution between 2020 and 2030, 9 of which relate to NO_x emissions and 12 of which specifically address the agricultural sector. The new policies and measures also require sufficient monitoring. In 2018 the *Deutsche Umwelthilfe* initiated a project called "NO₂ Citizen Science" to access emission data in several countries including Germany. The city-specific measurements help to monitor the annual changes. As Nordrhein-Westfalen is a mostly urban area, several of the measurement point were located in large cities. The project provided recommendations on the revision of the Ambient Air Quality Directives based on the WHO air quality guidelines and the lowered advised air quality value limits.

4.5.2 Sustainable development/Socio-economic development

The interviewee from the Umweltbundesamt (UMB) (interviewee 13) informed us about the German nitrogen emissions (mainly ammonia). They described the emission of the country as steady in the last two decades, despite a slight increase detected a couple of years ago due to biogas production. Lately it has shown a decrease as Germany has agreed to reduce their emission by 29% before 2030 following the NEC directive. This decreasing trend is predicted to continue nationally.

The NO_x depositions in the border region between 2000 and 2015 show that the border with the Netherlands (North-West Germany) is the most problematic area. This could indicate cross-border effects, but the elevated depositions could also be attributed to the high number of pig farms in the region. The Netherlands is considered a huge contributor to the nitrogen input, but ammonia deposits fast and does not travel far by air, making its impact mostly local and making it unlikely to affect cross-border areas. So, even though west winds are dominant in this German region – which could indeed cause high levels of NO_x deposition from the Netherlands – the German pig farms themselves may be huge contributors to pollution in the border region. Further measurements are needed to estimate the size of the contribution from the Netherlands.

Nitrogen has a high impact on the ecosystem, and ammonia is a precursor of PM_{2.5}. Therefore, it can also have an indirect effect. If the nitrogen input is too high (higher than the critical load that an

ecosystem can take), it impacts the ecosystem and could lead to decreased biodiversity. Looking at ecosystems in Germany, the most overloaded areas are located in the border region with the Netherlands.

As the directives are implemented differently in countries, Germany uses lower cut-off values for Natura 2000 areas than the Netherlands. Building a new facility requires an assessment of nitrogen input and deposition; in Germany the norm of 0.3 kg/ha/year cannot be exceeded. There are fewer permits given for building new facilities in the Netherlands and it is less problematic to carry out construction.

4.5.3 Euregional cohesion

An interviewee from NABU-Naturschutzstation (interviewee 14) mentioned that Germany still has not transposed the Nitrates Directive, which could lead to a daily fine of €800,000 by the EU Court. The measures introduced by the governments were not sufficient, and the regulations are currently under revision. The regulation mainly focuses on water pollution, and there is no discussion about ammonia deposition by air. Environmental organisations, scientists, consumer organisations, veterinarians, farmers and chemical companies have drawn up several measures to reduce the effect of agriculture on the environment although their practical implementation is faced with difficulties. These difficulties could be financial, governmental or caused by a lack of human resource but are most likely a combination. As previously mentioned by the other interviewee, they described a decrease in emissions and assumed a slight decrease in nitrogen deposition in the future. Extensive measurements and qualitative data on ammonia are not yet available.

The system Germany uses for measuring and modeling air quality and nitrogen deposition is vastly different from the Dutch system, making them hard to compare. The interviewee would suggest a cooperation at scientific level as there is no cooperation in any of the sectors to tackle the existing emission problems. Partly, the reason for this is the lack of capacity in Germany, and it is hardly possible to start any cooperation as long as the nitrogen problem has not even been addressed properly within Germany itself. There is a need to deal with national problems first and foremost.

According to interviewee 14, over 60% of the nitrogen deposition is produced by the agricultural sector, its emissions are highest in North-West Germany (including NRW) and the source is mainly husbandry. According to this interviewee, the Dutch policy could be a good example for Germany to tackle the nitrogen problem. Although there is no specific data, they said that farmers might relocate to Germany due to the less strict regulations there.

5. Discussion

Under this section, a more holistic approach is taken as the aim is to discuss the different effects of the Dutch *Stikstofbeleid* on the Euregion Meuse-Rhine and the various regions assessed in this dossier. Overall, it will be indicated that the actual effects on the Euregion (whether positive or negative) are currently limited.

In relation to farmer mobility, it cannot be stated certainly and concretely that the Dutch Nitrogen Policy is causing farmers to move between the different border regions. Through the various interviews, it can be surmised that there is an awareness of possible farmer mobility due to the different approaches taken within each region and the difference in their levels of strictness. However, the actual number of farmers moving is limited currently. Hence, the awareness nor the concern regarding farmer mobility have yet materialised into an actual effect of the Dutch *Stikstofbeleid*. However, what can be deemed an effect is the different approaches taken, or the lack thereof, by the regions. Wallonia has implemented stricter regulations to prevent, or at least minimise, cross-border farmer mobility. In Flanders the permit policies likewise have become much more restrictive, to the point that they deter Belgians and foreigners alike from starting a farming business. Germany, however, has not implemented such restrictions so far. Nevertheless, once again, it cannot be concretely stated that this actions have been influenced solely by the Dutch policy. Besides that, the Dutch interviewees mentioned the possibility of farmer relocations much further away, including Poland and Canada, due to the less restrictive policies and available land there. In the end, whether Dutch farmers will relocate – and where – will largely depend on the course the Dutch nitrogen policy will take in the future and the options available in other countries.

5.1 Limitations

First of all, the Dutch *Stikstofbeleid* is a new and relatively recent policy. Its recency makes it difficult to identify its effects as they mostly cannot be measured yet. Especially within the cross-border regions, there is still a lack of communication and coordination regarding this topic. Because the Dutch *Stikstofbeleid* is a current policy and there is a lack of collaboration between the constituent regions of the Euregion, the available data, including on nitrogen emissions, was limited. This has further restricted the research for this dossier. Another hindrance was the lack of previous literature on this particular issue. As a result, a lot of the findings presented in this dossier had to be gathered through expert interviews.

Importantly, it should be mentioned that the number of expert interviews was limited as well, due to time constraints. This may have resulted in selection bias. The risk of introducing this type of bias was minimalised, however, by including interviewees from the regions studied and from different occupations, including government officials, farmer representatives, and researchers. In addition, the conducting of interviews may lead to interviewer bias and (non-)response bias, both of which were minimalised by using semi-structured questions and by interviewing participants who worked with the topic from specific perspectives, in this case their various occupations.

6. Conclusion

Preliminary research shows that the *Stikstofbeleid* currently has had a limited impact on the Meuse-Rhine region as the Netherlands implemented stricter measures later than its neighbours. However, in the long run, some cross-border effects are expected in Flanders and Wallonia. According to some interviewees, the most important expected effect is a massive relocation of Dutch farmers to the bordering regions. However, from a legal perspective and considering the legislation's tightening in both regions, a massive relocation wave is unlikely to take place. Regarding North-Rhine Westphalia, it remains unclear whether or when the local government will respond to the urgency of their nitrogen issues and thus which effects the Dutch policy will have on their approach.

While there is collaboration at cross-border level on practical projects to protect Natura 2000 areas (see figure above), the implementation of concrete impactful measures remains a purely national or federal affair. However, various interviewees mentioned potential solutions on how to improve the situation in cross-border regions, most of them focusing on harmonisation of policies, increasing the focus on an integral approach, and increasing close collaboration between neighbouring countries.

The lack of harmonisation regarding the nitrogen-reduction approach is abundant in the Euregion Meuse-Rhine, although initial steps have been taken towards collaboration between the various countries in the Euregion. Nevertheless, when taking into account the existence of a European 'nitrogen blanket' and the local nitrogen peaks as a result of cross-border nitrogen deposition, it remains unclear whether harmonisation of national policies would be the right option compared to the development of new nitrogen-reduction regulations at European level. Moreover, the effectiveness of the Dutch policy's focus on the KDW in its present implementation as well as on other potential nitrogen-reduction strategies – such as the implementation of a threshold – is still under debate. In addition, taking into account the rising urgency of other crises such as the climate and zoonoses crises, it is imperative that multilateral and integral policies be implemented to tackle these issues in a sustainable and holistic manner.

Nevertheless, further research is needed to fully encompass the effects of the Dutch nitrogen policy on the cross-border Euregion Meuse-Rhine. An example of future research could involve the EU fertilising products regulation, which passed in 2019 (European Council regulation n°2019/1009) and which will enter into force in June 2022. Pursuant to the free-movement-of-goods principle, this new regulation promotes the trade of manure across borders, which was forbidden until now, at least in Wallonia. The narrative behind the authorisation of this trade is to encourage the circular economy. On paper this is a good thing. However, until now, the exportation of manure was forbidden as it was considered a waste product. Considering that Wallonia has banned the import of waste, Walloon farmers could not buy manure. With this EU legislation about to be passed, manure could be considered a raw material (provided it is mixed with additional fertilisers) and could, as such, be exported without restrictions. Concretely this means that Flemish, Dutch or Walloon farmers with a manure surplus that they are not legally allowed to use themselves will be able to export their excess manure. The problem is that it will be much more difficult for the competent authorities to monitor the import of this manure. In the case of Wallonia, this may jeopardise the region's efforts so far to limit its nitrogen pollution. Further research is needed, however, to assess the impact of this EU legislation.

7. Policy Recommendations

Under this section of the dossier, policy recommendations are provided based on the research conducted thus far, and on the subjects discussed in the previous sections. The recommendations put forward pertain to a bottom-up approach.

- This dossier can be considered a first step in research into the area of cross-border cooperation on environmental issues. Nevertheless, it should be understood that further cross-border research is of utmost importance for further cooperation to take place. When considering the regions on an individual basis, information and data can be collected more easily. However, it is still essential that such information be made available within the Euregion, in order to enhance further collaboration. Therefore, more exchange of data and information is proposed. The combination of further cross-border research and exchange of data and information could then be adequate initial steps towards a collective approach to nitrogen emissions.
- The exchange of information is a starting point for government cooperation. However, it is also a necessary step to ensure that the governments in the Meuse-Rhine region do not unintentionally undermine each other's nitrogen policies. This is especially important for the Natura 2000 areas in the border regions, as local policies just across the border could be detrimental to a nature reserve in another country. Therefore, it is important to regulate nitrogen-emitting activities in the border regions in a standardised way across all countries in a particular region. This requires harmonisation of the permit-approval policies in the countries involved in the Euregion, which can be achieved by using the same decision framework for the granting of permits. Also, these countries need to adopt the same measurement method to accurately judge the impact of a new economic activity on nitrogen emissions in all countries in a border region. Better and more regular communication should be established for such cooperation to materialise.
- Our research has made clear that there is a distinct lack of communication and collaboration between the four constituent regions of the Euregion Meuse-Rhine. As mentioned before, this lack leads to poor tackling of the problem at Euregional level. Doing so, however, is essential for environmental policies to have a real positive effect. Consequently, institutionalised communication and coordination are imperative. We advocate here that this communication and coordination be based on pre-existing organisations, such as the Benelux Union. Although the Benelux Union does not yet cooperate on nitrogen matters, environmental topics are regularly discussed as part of the implementation of certain European directives or International agreements (e.g. Paris agreements). This pre-existing collaboration could therefore be a strategic starting point for increased exchange on the issues faced by each country and the solutions devised at the various national levels. Note, however, that this collaborative solution would exclude Germany.
- To include Germany, a working group could be set up within the Euregion Meuse-Rhine institution itself, so as to address the problem in a more targeted way. However, this collaboration faces two obstacles: First, the Euregional organisation lacks an institutional

framework for environmental purposes. This would make communication and coordination very difficult to achieve and time consuming should action be required in the very near future. To anticipate on this, such a framework should be created beforehand. The second obstacle lies in the lack of administrative competences on environmental matters in the constituent provinces of the Euregion Meuse-Rhine (i.e. Dutch and Belgian Limburg, Liege, etc.). This means that, although mutual communication could take place, the coordination and implementation of concrete actions would be more difficult. As such, educating current administrative staff or hiring new staff with existing knowledge on environmental matters would be another step towards establishing an adequate working group.

In summary, more collaboration and communication should take place between the different regions, to be backed by the implementation of a standardised (nitrogen) policy at European level.

8. Annexes

Annex I: Overview of interviewees

<u>Number</u>	<u>Region/ Country</u>	<u>Organisation</u>	<u>Date</u>
1.	The Netherlands	Dutch Professor of Environmental Law	18-05-2022
2.	The Netherlands	Province of Limburg	09-05-2022
3.	The Netherlands	Limburgse Land- en Tuinbouwbond (LLTB)	26-04-2022
4.	Wallonia	Walloon Research Centre for Agriculture	22-04-2022
5.	Wallonia	Walloon Public Service	18-03-2022
6.	Wallonia	Walloon Public Service	06-05-2022
7.	Wallonia	Walloon Federation for Agriculture	10-04-2022
8.	Flanders	Departement Landbouw en Visserij	06-05-2022
9.	Flanders	ILVO	06-05-2022
10.	Flanders	VMM	14-04-2022
11.	Flanders	Natuurpunt	13-05-2022
12.	Euregion Meuse-Rhine	Coordinator of Three Countries Park	05-04-2022
13.	Germany	UMB	12-05-2022
14.	Germany	NABU-Naturschutzstation	10-05-2022