

This project is co-funded by the European Union and the Republic of Turkey.

Protection Of Waters Against Agricultural Pollution Through Establishment Of A Monitoring And Reporting Methodology For The Nitrate Action Plans

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NATIONAL CONFERENCE PROTECTING WATERS AGAINST AGRICULTURAL POLLUTION

Examples from selected EU Member States Dr Darko Znaor

June 2, 2022 Ankara















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 Designation & minister of Nitratio Valenzable Zenes
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- 1. Water monitoring for the Nitrates Directive
- 2. Designation & revision of Nitrate Vulnerable Zones
- 3. What farmers must do?
- 4. Knowledge transfer & research
- 5. Infringement procedures

To be shown using examples from 7 EU Member States: AT, DK, GR, IRE, IT, NL and PL



Water quality monitoring organisation & methodologies used

Water quality monitoring - Ireland

Running since 1991

2. Since 2007, for the Nitrates Directive has been an integral part of the Water Framework Directive National Monitoring Programme

Two main types of monitoring networks:

- Surveillance to provide a long-term picture: 287 surface water bodies and 259 groundwater bodies
- Operational to assess the status of water bodies at risk of failing to meet environmental objectives and to assess if a change in the status of a water body is the result of a programme of measures: 2,418 surface water bodies and 133 groundwater bodies.
- 4. Covers 66% of the total number of water bodies (= 4,829)

LOCATION OF MONITORED SURFACE WATER AND GROUNDWATER BODIES TAKING PART IN THE NATIONAL WATER QUALITY MONITORING PROGRAMME 2019-2021



Source: EPA 2021

Frequency of nutrients (N and P) monitoring - IRELAND



- <u>Rivers</u>: 5 times per annum in operational monitoring and 12 times per annum in surveillance monitoring
- <u>Lakes</u>: 4, 6 or 8 times per annum in operational monitoring. In surveillance monitoring 12 times per annum every three years and as per operational monitoring frequency in the other years.
- <u>Transitional water</u>: 4 times per annum with a minimum of 3 years in 6 years
- <u>Coastal water</u>: 4 times per annum with a minimum of 3 years in 6 years

Water quality monitoring of watercourses – Denmark



- Surface water: 210 stream sampling stations (doubled in last 10 yr.) Extracted from the "ODA Database" holding monitoring data from watercourses, lakes and marine areas
- ODA Database contains some errors that must be fixed manually!
- Average annual value are calculated as the average of all nitrate analyses for each measuring station for each year (at least 7 samples per year)
- Average winter values (1 Oct to 31 March)

Water quality monitoring of lakes – Denmark

- 20 lakes analised for nitrate concentration
- 447 lakes with measurements of Chlorophyll a
- Sampling frequency for nitrate concentration: 18-19 times per year, monitored every second year
- Nitrate concentrations = (i) average of the annual averages and
 (ii) winter averages
- Chlorophyll a concentrations: once in 2 years or once in 4 years
- Sampling frequency for Chlorophyll a concentration: 3-11 times during the summer

The governance network supporting the application of Nitrate Directive in the Lombardy plain (the Po River watershed, Italy)



Fig. 4 Final INM representing the governance framework. The size of the nodes corresponds to the perceived influence of each actor. List of acronyms used in the map in alphabetical order: ARPA Regional Agency for Environmental Protection, BGS biogas and compost plants, BRD breeders, BRK brokers, CNS agricultural consultants, CNT agricultural contractors, CTZ non-farm residents, CWP civil wastewater treatment plants, DGA Regional Directorate for Agriculture, DGE Regional Directorate for Environment, EU European Commission, FDC food companies, FRM farmers, FTU farmers' trade unions, HS high schools, IRI international research institutes, IWP industrial wastewater treatment plants, MCN agricultural machinery manufacturers, MNC municipalities, NER National Institute for Environmental Protection and Research, NG national government, NGO environmental NGO, NRI national research institutions, PLC environmental police, PRK parks, RBA Po River Basin Authority, RTL agricultural retailers, SFC seed, fertilisers, animal feed companies, SRA sub-regional administrations, STC sludge treatment companies, VLN environmental volunteers, WCI water consortia (irrigation), WCL water consortia (lakes)

Source: Musacchio et al., 2019

Water quality monitoring in private wells – Germany



- Run by VSR environmental NGO
- Independent of governments, political parties and economic interest groups
- Cooperation with citizens and universities
- Monitoring provides nitrates data of the nearsurface groundwater
- Particularly high nitrate concentrations in regions dominated by maize and wheat
- Less nitrates found in organic farming!



Designation and revision of Nitrate Vulnerable Zones



The case of Poland



9 EU MS whole territory approach, others "leopard's skin" approach Poland:

- Several times changed its NVZ area
- 2004-2008 = 2%
- 2008-2012 = 1.49%
- 2010 = infringement proceedings by the EC
- 2012-2016 = 6.8% (= 94 NVZ)
- Nov 2014 = judgment of the Court of Justice of the EU
- Jan 2017 = 80%
- Jul 2017 = 100%
- Jul 2018 = infringement proceedings stopped

Nitrate Action Programmes Farmers' obligations

Common requirements Code of Good Agricultural Practice & Nitrate Action Programmes



 Periods of prohibition of application of chemical fertilisers & manure
 Capacity of manure storage and construction requirements
 Provisions on applic. of fertilisers on water-saturated, flooded, frozen and snow-covered ground
 Provisions on fertilisation on slopes and hear watercourses
 Provisions on procedure for land application of fertilizers, incl. technical instructions and manners of application
 Winter coverage of soils, incl. timing, tilling and other agricultural techniques and measures, etc.

Limitation of total fertilization (mineral and organic) by types of crops
 Maximum amount of livestock manure to be applied (170 kg N/ha/yr)
 Rational fertilisation, incl. the amounts of available N or available P applied, soil tests, etc.

IRELAND – specific requirements



- **1.** Farm records that must be maintained
- 2. Farmyard and silage bales storage
- 3. Soil sampling area
- 4. Prevention of poaching
- 5. Use of low emission slurry spreading equipment
- 6. Maximum crude protein content permissible in concentrate feedstuff fed to grazing livestock
- 7. Completion of Farm Advisory Service training in nutrient use efficiency
- 8. Grass reseeding
- 9. Hedgerow maintenance
- **10.** Bovine livestock directly drinking from waters
- 11. Fencing of riverbanks & supplementary drinking points
- 12. Correction of soil pH

THE NETHERLANDS – specific requirements



Huge N and P soil surpluses : 128 kg N/ha, 11 kg P₂O₅/ha Almost 60% of the freshwater bodies are eutrophic! Production rights for dairy cattle and rights for keeping chickens and pigs (2014-2018)

- 1. Sophisticated fertilisation plans and N & P balance sheets
- 2. Manure records must be kept. Obligations for transport, manipulation and processing of manure
- 3. Nitrogen in organic manure: derogation for cattle farmers with 80% grassland: 230 250 kg/ha
- 4. Available nitrogen defined per (i) crop, (ii) soil type and (iii) region
- 5. Nitrogen availability coefficients for mineral fertilisers and livestock manure
- 6. Mineral P fertilisers not allowed at farms using derogation
- 7. Very strict P application standards (based of the soil P status)
- 8. Phosphate quota dairy farming
- 9. Animal quota pigs and poultry
- 10. Catch crop after maize on September 21 or undersowing of grass in maize
- 11. Catch crop after potato before October 31

"Livestock manure laundering" – the Netherlands



An analysis of over 300 criminal inquiries into fraud involving the disposal of manure has shown that farmers are largely getting away with the practice, the NRC reports.



Knowledge transfer & research

Irish knowledge transfer & research programmes on water and agriculture

Cooperation between state authorities, extension service, research institutes and farmers





Austrian regional knowledge transfer programmes



Water Conservation Farmers – a 2020 programme of the Styrian Chamber of Agriculture – demonstration trials testing best agricultural techniques for protecting water & debate with general public Groundwater 2020 – initated by the Government of Upper Austria to protect ground water from adverse agricultural practices, comprising a set of educational, demonstration and applied research activities





An awareness raising programme on N-compounds - Germany

- Financed by the Federal Ministry of Envronment and German Environment Agency
- Implemented by the "German Environmental Help" a major environmental NGO



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Umwelt 🌍 Bundesamt

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[NO₃⁻]

Nitrat ist für Pfanzen lebenswichtig. Es hitt hinen beim Wachsen. Sie brauchen es für den Aufbau von Eiweißen. Daher wird Nitrat in der Landwirtschaft als Dünger ausgebracht – entweder durch Gülte und Mist aus der Tiechnätung oder durch künstlichen Dünger. Doch nehmen die Pflanzen das Nitrat richt vollstämdig auf, sucht sich dieser sehr mohlle Geselle seinen Weg in Grundwasser, Seen, Flüsse und wandert bis in die Meere. Große Ansammlungen des Nitrats führen zur Überdüngung und verschlechtern die Lebensbedingungen für Tiere und Pflanzen.



[NH₄⁺]

aus Ammoniak. Es reist vornehmlich in der Luft und schließt sich gerne staubigen Reisegruppen an,

die sich auch in unsere Lungen verirren und dort großen Schaden anrichten. Mit dem Regen gelangt es aus der Luft in Böden und Gewässer und wird dort durch Bakterien in Nitrat umgewandelt. Dies führt zu Versauerung und Nährstoffanreicherung.

Nittrit entsteht als Zwischenschritt, wenn Bakterien für ihre eigene Energiegewinnung das Ammonium in Nitzt umwanden. Feht der Sauerstoff, können die Bakterien ihre Arbeit nicht beenden und giftige Nitrite bleiben in Böden und Gewässem und reichem sich in der Nahrung an. Auch übermäßig nitratbelastete Lebersmittel können gefährlich werden: Bei fälscher Hygiere oder Lagerung bildet sich Nitrit – das ist für Babys gefährlich und kann auch krebszergend wirken.

[NO₂⁻]



.. and a list of responsible ministers of agriculture since the inception of the Nitrates Directive



Bundesländer gegen den EU-weiten Nitratgrenzwert von 50 mg/l. 10 Deutsche Umwelthilfe as Problem seit 1991 verklima retten Fördermitglied

Hier finden Sie die verantwortlichen Landwirtschaftsminister*innen seit 1991.

- Ignaz Kiechle (30. März 1983 bis 21. Januar 1993)
- Jochen Borchert (21. Januar 1993 bis 26. Oktober 1998)
- Karl-Heinz Funke (27. Oktober 1998 bis 12. Januar 2001)
- Renate Künast (12. Januar 2001 bis 4. Oktober 2005)
- Jürgen Trittin (übergangsweise bis zur Bildung der neuen Bundesregierung)
- Horst Seehofer (22. November 2005 bis 27. Oktober 2008)
- Ilse Aigner (31. Oktober 2008 bis 30. September 2013)
- Hans-Peter Friedrich (17. Dezember 2013 bis 17. Februar 2014)
- Christian Schmidt (17. Februar 2014 bis 14. März 2018)
- Julia Klöckner (seit 14. März 2018)

"Bread Protecting Water" initative in 4 Bavarian regions

INITIATIVE WASSERSCHUTZBROT

Regierung von Unterfranken Regierung von Oberfranken Regierung von Mittelfranken Regierung von Niederbayern





Suchbegriff eingeben



Infringement procedures by the Court of Justice of the European Union & national courts for not complying with the requirements of the Nitrates Directive 20 ongoing cases relevant to the Nitrates Directive at the Court of Justice of the EU ...against 12 EU Member States



- 1. Austria
- 2. Belgium
- 3. France
- 4. Germany
- . Greece
- 6. Ireland
- 7. Italy
- 8. Luxemburg
- 9. the Netherlands
- 10. Poland
- 11. Spain
- 12. UK

European Court of Justice fined Greece for improper implementation of the Nitrates Directive

- In a judgment from 2015 the Court found for the first time Greece failed to fulfil its obligations
- In February 2020, it fined Greece with 3.5 million EUR because:
 - 1. Surface water and groundwater in the Nitrate Vulnerable Zones of the Plain of Thessaly and of the River Evros have concentrations of nitrates above 50 milligrams per litre and/or are eutrophic.
 - 2. Greece failed to establish action programmes against nitrate pollution within one year after the designation of those zones.
 - Greece started "fixing" problems indicated by the Court too late.





"Nitrate" lawsuits in Germany





- In 2016 the EC referred Germany to the Court of Justice of the EU because of the Nitrates Directive
- In 2018 DUH initiated lawsuits against the Federal State of Germany and in 2019 against the Governments of the States of Lower Saxony and North Rhine-Westphalia
- A "Nitrate Initiative" in February 2022: 9 major environmental NGOs urging the new Federal Government to better implement the Nitrates Directive
- On-going cases at the German courts

A 75-page DUH's lawsuite against the Federal State of Germany



Parameter	Ortho- phosphat- Phosphor (o-PO ₄ -P)	Gesamt- Phosphor (Gesamt-P)
Einheit	mg/l	mg/l
Statistische Kenngröße	MW/a ⁴	MW/a ⁴
Typen nach Anlage 1 Nummer 2.1		
2.1, 3.1, 2.2, 3.2, 4, 11 ⁶	≤ 0,05	≤ 0,10
5, 5.1	≤ 0,07	≤ 0,10
6, 6 K, 7	≤ 0,07	≤ 0,10
197	≤ 0,10	≤ 0,15
9	≤ 0.07	≤ 0.10
9.1, 9.1 K	≤ 0.07	≤ 0.10
9.2, 10	≤ 0,07	≤ 0,10
11 ^{7,8} ,	≤ 0,10	≤ 0,15
12 11 ^{7,9} , 12 ^{7,9}	≤ 0,10	≤ 0,15
14 ¹⁰ , 16 ¹⁰	≤ 0,07	≤ 0,10
14 ¹¹ , 16 ¹¹ 18	≤ 0,07	≤ 0,10
1912	≤ 0,10	≤ 0,15
11 ^{8,12} , 12 ^{8,12}	≤ 0,10	≤ 0,15
11 ^{9.12} . 12 ^{9.12}	≤ 0,10	≤ 0,15
15, 15 g, 17, 20	≤ 0,07	≤ 0,10
22	≤ 0,20	≤ 0,30
23	≤ 0,07	≤ 0,10
Subtyp 21	≤ 0,07	≤ 0,10

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12. Petition, "Stoppt die Gülle-Verschmutzung - Schützt unser Wasser!". 13. Taube, Expertise zur Bewertung des neuen Düngerechts (DüG, DüV, Stoff-BilV) von 2017 in Deutschland im Hinblick auf den Gewässerschutz, Kiel 2018 14. EuGH, Urteil vom 21. Juni 2018, C-543/16 - Kommission/Deutschland. 15. Antwort der Bundesregierung vom 15. März 2018 auf die Kleine Anfrage Vertragsverletzungsverfahren gegen Deutschland, BT-Drs. 19/1220. 16. DLO-Alterra Wageningen UR u.a., Recommendations for establishing Action Programmes under Directive 91/676/EEC concerning the protection of waters against pollution caused by nitrates from agricultural sources. Part D - Recommendations for Measures. Final Report, 2011. 17. LAWA, Eckpunkte für die Weiterentwicklung des Landwirtschaftsrechts zum Schutz des Grundwassers, Magdeburg, 2012. 18. KLU, Novellierung der Düngeverordnung. Kurzstellungnahme der Kommission Landwirtschaft beim Umweltbundesamt, Dessau-Roßlau, 2014. 19. Bach/Klement/Häußermann, Bewertung von Maßnahmen zur Vermindestoffüberschüsse, UBA-Texte 55/2016, Dessau-Roßlau, 2016 (Auszug). 20. Umweltbundesamt, Indikator: Nitrat im Grundwasser (online verfügbar un-2017. 21. SRU/WBAE/WBD, Novellierung von Düngegesetz und Düngeverordnung -Offener Brief, Berlin, 2016. 22. Klages/Osterburg/Hansen, Betriebliche Stoffstrombilanzen für Stickstoff

- 23. Stellungnahme des Einzelsachverständigen Prof. Dr. Friedhelm Taube,
- 24. WBA/WBD/SRU, Kurzstellungnahme. Novellierung der Düngeverordnung: Nährstoffüberschüsse wirksam begrenzen, 2013.

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- der Abgeordneten Friedrich Ostendorff, Harald Ebner, Renate Künast, weiterer Abgeordneter und der Fraktion BÜNDNIS 90/DIE GRÜNEN. Bewertung des reformierten Düngerechts und Stand zu EU-
- rung von Nitrateinträgen in die Gewässer auf Basis regionalisierter Stick-
- ter https://www.umweltbundesamt.de/indikator-nitrat-im-grundwasser),
- und Phosphor Berechnung und Bewertung (Auszug), Braunschweig, 2017.
- 18(10)373-B.

7 key takeaway messages:

Diverse, non-uniformed water monitoring programmes in MS 1, ...but functioning well and constantly improving 2. Nitrate Vulnerable Zones are under a constant revision 3. Demanding requirements on farmers 4, 5. ...and getting stricter Robust knowledge transfer & research programmes 6, 7. Infringement procedures against 12 EU MS



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