

# The Costs of Green Agriculture in Germany

## 德国绿色农业的成本

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# Why did farmers protest?



Video: rbb24 | 26.11.2019 | Bild: dpa/Kumm

Protest gegen Agrarpaket

## Warum die Landwirte nach Berlin gefahren sind

26.11.19 | 22:41 Uhr

**Mehr Tier- und Umweltschutz, mehr Rücksicht auf Insekten, weniger Gülle - all das sieht das geplante Agrarpaket der Bundesregierung vor. Doch viele Landwirte sehen sich in ihrer Existenz bedroht. Am Dienstag protestierten sie - aber wogegen genau?**



More animal and environmental protection, more consideration for insects, less fertilizers - all of these are provided in the federal government's agricultural package. But many farmers see them as existence threats. On Tuesday they protested - but what exactly?

# “Green” Agriculture: A World Movement

- Less fertilizers
- Less pesticides
- Less herbicides
- Less greenhouse gas emission
- Less soil erosion
- More environmental protection
- More biodiversity
- More animal welfare
- More organic agriculture
- .....

- Questions: What happens for “Green Agriculture” in EU and Germany ?



# EU policy tools: “Cross-compliance” in Common Agricultural Policy

- “Cross-compliance” Linking income support to respect for high European Union standards **for public, plant, and animal health and welfare**
  - environment, climate change and good agricultural condition of land;
  - public, animal and plant health;
  - animal welfare.
- Two types of requirements
  - Statutory management requirements (SMR)
    - apply to all farmers whether or not they receive support under the common agricultural policy (CAP);
  - Good agricultural and environmental conditions (GAEC)
    - apply only to farmers receiving support under the CAP.



# Statutory management requirements(SMR)

- Public, animal and plant health
  - general food law (EU regulation 178/2002)
  - hormones ban directive (Council Directive 96/22/EC)
  - regulations on identification and registration of pigs, bovine, ovine and caprine animal (EU regulation 1760/2000, Council Directive 2008/71/EC, EU regulation 21/2004)
  - regulation on prevention, control and eradication of transmissible spongiform encephalopathies (TSE) (EU regulation 999/2001)
  - regulation on plant protection products (EU regulation 1107/2009)
- Animal welfare
  - directives on the protection of calves, pigs and animals kept for farming purposes (Council Directive 2008/119/EC, Council Directive 2008/120/EC, Council Directive 98/58/EC)
- Environment
  - **nitrates directive (Council Directive 91/676/EEC)**
  - directive on the conservation of wild birds (Directive 2009/147/EC)
  - directive on the conservation of natural habitats and of wild fauna and flora (Council Directive 92/43/EEC)

# Good agricultural and environmental conditions(GAEC)

- prevent soil erosion by defining minimum soil cover and minimum land management practices;
- maintain soil organic matter and soil structure;
- maintain permanent grassland;
- protect biodiversity and ensure the retention of landscape features for example, through a ban on cutting hedges and trees during the bird breeding and rearing season;
- protect and manage water through the establishment of buffer strips along water courses, authorisation on water for irrigation and protection of ground water from pollution.

# Penalties for non-compliance

- Under the cross-compliance system, farmers not respecting EU rules can see the following support reduced:
  - direct payments (decoupled or coupled);
  - most rural development payments: area based payments including agri-environmental measures, areas with natural constraints, [NATURA 2000](#) measures, afforestation measures, forest environmental payments, agroforestry, organic farming;
  - wine sector payments: restructuring and conversion of vineyards and green harvesting.
- Percentage of reduction for non-compliance (different level: **Severity, Extent, Permanence, and Reoccurrence**)
  - **Negligence** :3% of the overall amount granted to the farmer (1%-5% by Paying Agency)
  - **Repeated non-compliance**: up to a maximum of 15%.
  - **Intentional non-compliance**: reduction of 20% of the overall amount granted to farmer. (could be less than 15%, also could up to 100%)
  - **Minor non-compliance** : early warning, and not payment reduction
  - **Minor reduction**: if reduction less than 100 Euros, it could be exempted.

# Fertilizer regulation in Common Agricultural Policy (Main topic in this report)

- rural development measures
  - agri-environment measures,
  - support for investments in storage of manure,
  - Training
- **cross-compliance**
  - the Nitrates Directive (Main tool)
  - establishment of buffer strips along water courses
- the operational programmes for fruit and vegetables.

# EU's Nitrates Directive : introduced in 1991

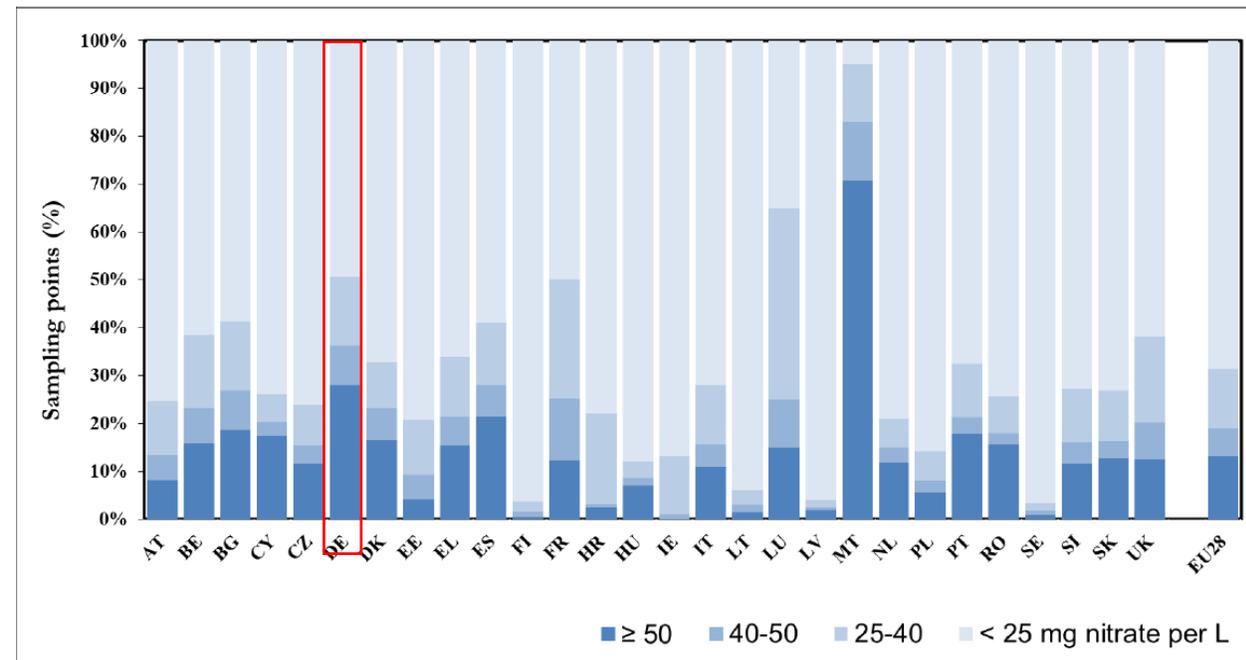
- two main objectives:
  - reduce water pollution by nitrates from agricultural sources
  - prevent further pollution
- The directive is managed by EU countries and involves:
  - monitoring water quality in relation to agriculture;
  - designation of nitrate vulnerable zones;
    - Exceeding or being at risk of exceeding **50 mg NO<sub>3</sub>/l for ground water** .
  - establishment of (voluntary) codes of good agricultural practice and of (obligatory) measures to be implemented in action programmes for nitrate vulnerable zones (NVZ)
    - 170 kilos as the maximum annual limit of nitrogen and 20 kg for P<sub>2</sub>O<sub>5</sub> from livestock manure that can be applied per hectare

# EU's Nitrates Directive : very detailed regulations

- Codes of good agricultural practice :
  - application periods;
  - fertiliser use near watercourses and on slopes;
  - manure storage methods;
  - spreading methods and crop rotation;
  - other land management measures.
- Action programmes must include:
  - obligatory measures concerning periods of prohibition of the application of certain types of fertiliser;
  - capacity of manure storage vessels;
  - limitations to the application of fertilisers (on steep slopes; to water-saturated, flooded, frozen or snow-covered ground; near water courses); as well as
  - other measures set out in codes of good agricultural practice.

# Ground water quality and nitrates

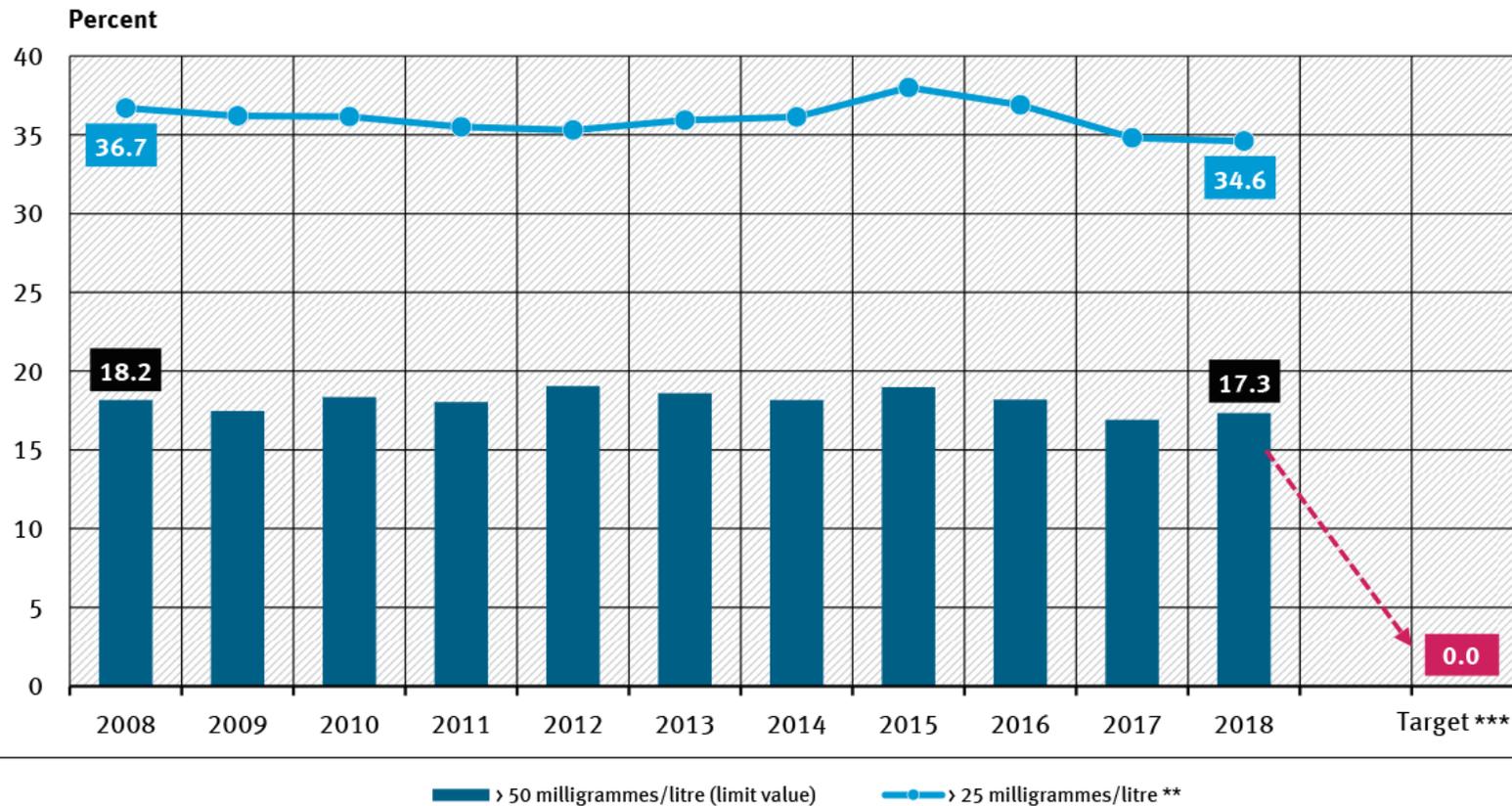
- EU groundwater
  - Groundwater quality In 2012–2015, 13.2% of groundwater stations exceeded 50 mg nitrates per litre and 5.7% were between 40 and 50 mg/l<sup>25</sup>
- Ireland, Finland and Sweden had in average almost no groundwater stations exceeding 50 mg/l.
- Malta, Germany and Spain respectively, 71%, 28% and 21.5% of groundwater stations on average exceeded 50 mg nitrate per litre.



**Figure A.** Frequency diagram of annual average nitrate concentrations in groundwater<sup>27</sup>. Results are presented for all groundwater stations at different depths.

# Nitrate in ground water

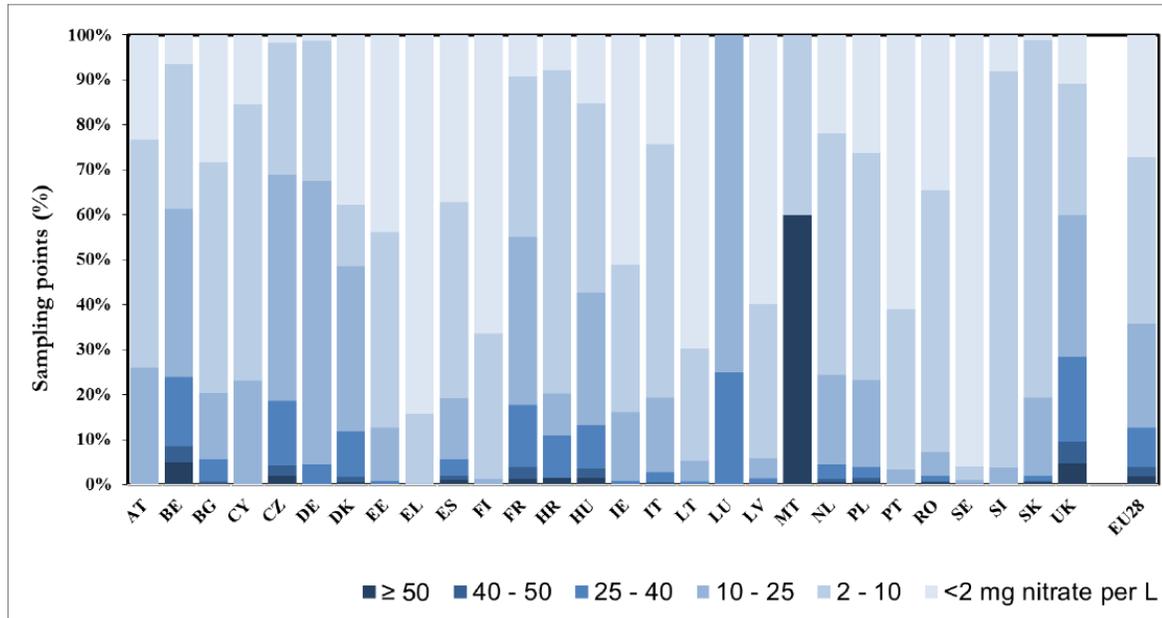
Proportion of sampling sites which exceed the target value for nitrate in ground water\*



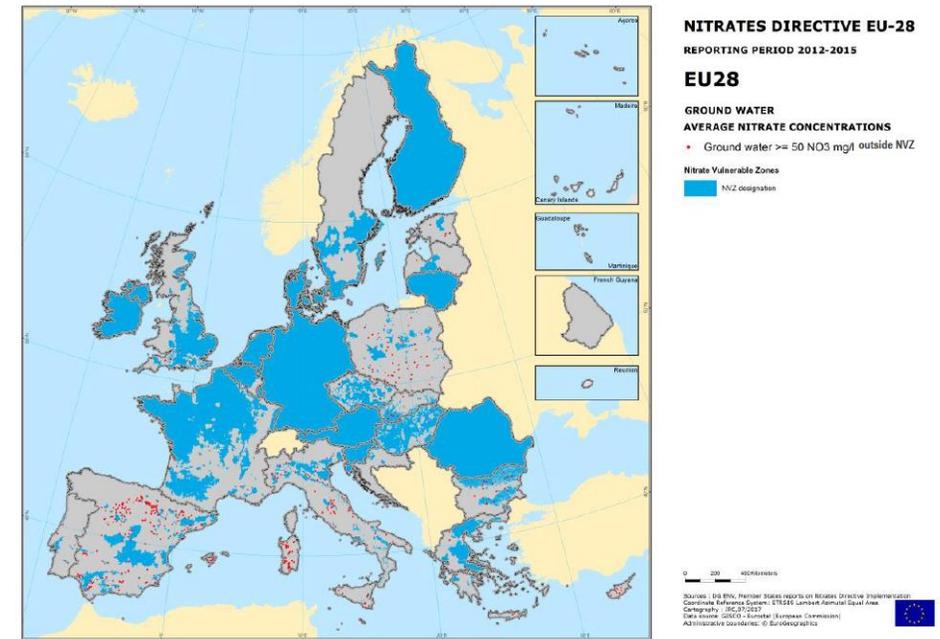
\* Basis: EEA monitoring network limit value: 50 milligrammes per litre annual mean value  
\*\* The value includes the percentage of sampling sites with > 50 mg/l.  
\*\*\* Target set by the Nitrates Directive and the German Sustainable Development Strategy

Source: German Environment Agency and the Länder Initiative on Core Indicators (LIKI) 2019 based on data from the German Working Group on water issues of the Federal States and the Federal Government

# Nitrates Vulnerable Zone: Germany!



**Figure B.** Frequency diagram of annual average nitrate concentrations in fresh surface waters (rivers and lakes)



**Map A.** Area designated as Nitrates Vulnerable Zone and groundwater monitoring stations with average nitrates concentrations above 50mg/L outside NVZ, period 2012-2015<sup>44</sup>.

Source: REPORT FROM THE COMMISSION TO THE COUNCIL AND THE EUROPEAN PARLIAMENT on the implementation of Council Directive 91/676/EEC concerning the protection of waters against pollution caused by nitrates from agricultural sources based on Member State reports for the period 2012–2015

# Nitrogen Fertilizer application in EU 27 (2008-2018)

Nitrogen fertiliser consumption by agriculture, EU-27, UK, IS, NO, CH, AL and TR, 2008-2018  
(in 1000 tonnes)

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Difference in % 2008-2018
<b>EU-27</b>	9 981.3	9 081.5	9 385.4	9 863.6	9 384.4	9 915.9	10 049.3	10 324.1	10 195.0	10 538.4	10 169.1	2
Belgium	134.6	147.4	151.3	143.8	143.1	149.8	152.0	154.1	156.0	156.0	156.0	16
Bulgaria	173.9	177.6	199.1	192.4	235.4	258.9	322.0	341.6	365.9	351.1	339.3	95
Czechia	341.6	253.8	270.3	352.7	349.0	331.6	325.7	397.1	407.2	397.6	351.8	3
Denmark	220.7	200.4	190.1	197.2	187.0	193.6	186.8	205.3	197.2	252.9	252.9	15
<b>Germany</b>	<b>1 807.2</b>	<b>1 550.6</b>	<b>1 569.0</b>	<b>1 786.5</b>	<b>1 640.4</b>	<b>1 648.8</b>	<b>1 675.3</b>	<b>1 822.8</b>	<b>1 710.6</b>	<b>1 658.8</b>	<b>1 496.6</b>	<b>-17</b>
Estonia	35.5	27.3	28.6	29.8	33.0	33.7	35.8	36.3	36.4	37.3	38.9	10
Ireland	309.0	306.8	337.6	295.8	296.5	353.0	331.8	331.0	339.1	369.1	408.5	32
Greece	201.0	184.8	212.9	181.4	175.4	182.6	165.9	164.3	185.0	192.2	179.4	-11
Spain	739.8	781.1	941.0	846.7	843.4	961.5	1 101.9	1 068.1	982.2	1 072.1	1 033.5	40
France	2 425.2	2 098.8	2 080.3	2 332.4	2 024.9	2 143.8	2 190.9	2 208.2	2 221.2	2 248.3	2 145.0	-12
Croatia	170.2	90.8	109.3	125.0	106.9	77.9	73.7	87.4	72.3	98.4	99.4	-42
Italy	589.0	587.5	586.1	585.0	583.8	582.4	581.1	579.7	578.4	577.2	529.9	-10
Cyprus	7.5	7.5	9.4	7.1	8.3	7.1	6.7	7.5	8.1	8.1	8.1	8
Latvia	47.5	51.9	59.5	59.8	65.2	69.7	72.9	75.8	78.3	77.4	74.5	57
Lithuania	118.3	134.4	143.2	147.0	150.0	155.0	162.0	166.6	160.2	167.1	159.4	35
Luxembourg	13.3	13.4	13.8	14.4	13.7	13.4	12.7	13.0	13.7	13.6	13.0	-2
Hungary	294.3	274.9	281.4	301.8	312.9	335.5	308.6	338.8	347.4	392.8	348.4	18
Malta	0.4	0.4	0.6	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	40
Netherlands	220.7	211.4	205.2	200.4	199.5	216.0	213.2	244.9	229.8	231.1	207.0	-6
Austria	108.5	89.1	104.8	98.2	107.9	110.6	121.6	125.3	132.0	111.9	100.1	-8
Poland	1 142.3	1 095.4	1 027.4	1 091.1	1 094.7	1 194.8	1 098.5	1 003.6	1 043.0	1 150.6	1 178.8	3
Portugal	105.1	97.3	100.2	97.7	108.5	111.1	130.0	117.9	108.4	105.7	100.5	-4
Romania	279.9	295.1	305.8	313.3	290.0	344.5	303.6	357.4	344.3	381.3	468.6	67
Slovenia	25.0	28.2	27.5	27.1	26.3	27.3	28.6	28.3	27.1	27.1	27.3	9
Slovakia	121.4	95.3	106.5	120.6	101.0	113.6	119.0	114.8	126.2	122.5	129.0	6
Finland	162.9	136.0	156.5	146.2	138.9	138.1	147.4	143.5	138.1	138.9	138.4	-15
Sweden	186.5	142.4	168.0	169.8	148.1	161.1	181.1	190.2	186.0	198.5	184.2	-1
United Kingdom	1 001.0	948.0	1 016.4	1 022.1	1 000.2	999.0	1 059.7	1 048.5	1 027.0	1 041.0	1 033.0	3
Iceland	15.4	12.2	10.9	10.5	12.1	11.6	14.3	11.6	10.8	13.1	13.1	-15
Norway	101.8	91.2	84.1	95.5	94.2	95.5	101.3	102.6	100.9	99.3	99.3	-2
Switzerland	50.8	47.9	55.5	48.9	47.2	45.7	51.6	45.8	48.5	51.6	47.9	-6
Albania	13.4	15.6	16.6	18.0	17.1	17.3	17.4	17.6	17.8	18.1	18.1	35
Turkey	1 133.1	1 413.8	1 343.7	1 259.4	1 431.9	1 584.2	1 492.8	1 486.6	1 896.5	1 764.6	1 527.6	35

Note: Italics: estimated data. For the following countries, values from 2017 were taken as a reference for 2018, because no data are available for 2018: Belgium, Denmark, Cyprus, Malta, Iceland, Norway and Albania.

Source: Eurostat (online data code: aei\_fm\_usefert)

- German had a significant reduction after 2016.
  - **German Fertilizer Ordinance in 2016**
- But, the European Union is not satisfied!

# amendment to the German Fertilizer Ordinance in 2020

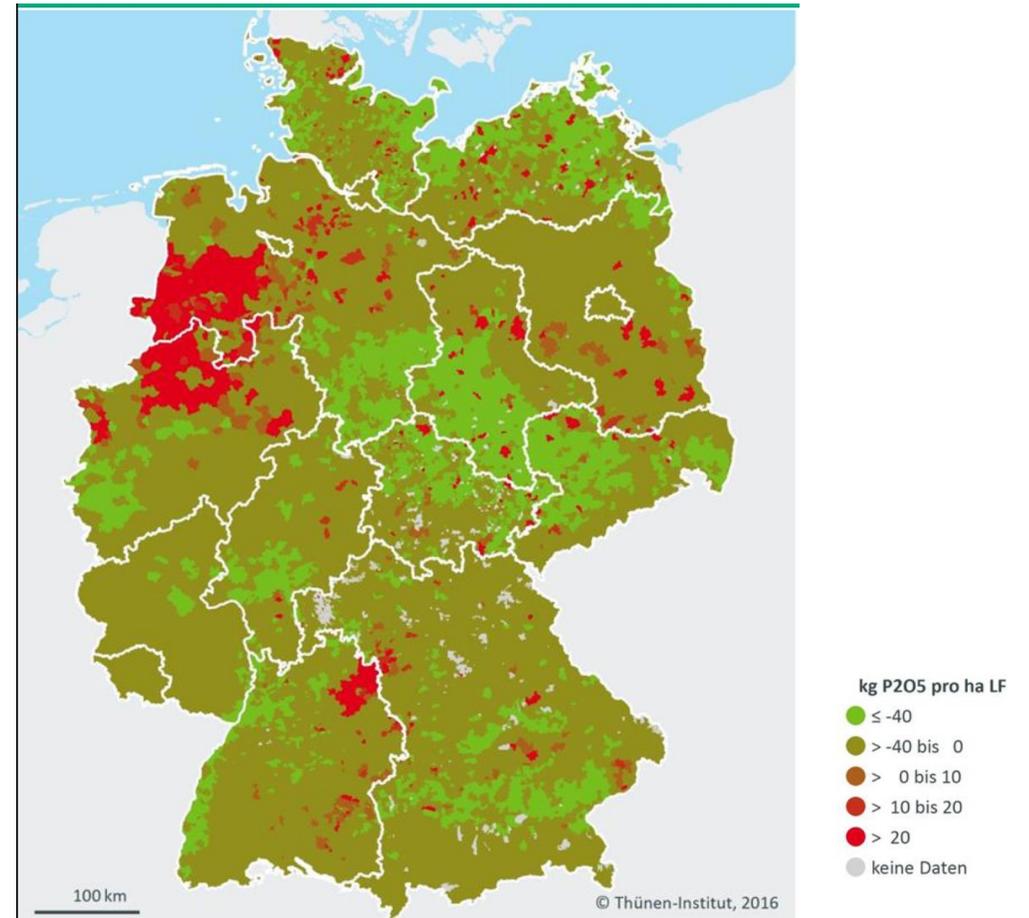
- If the stricter fertilizer regulation had not been adopted by the beginning of April of 2020, it would have initiated the second stage of infringement proceedings, at the end of which Germany could face fines of €850,000 per day by EU.
- The amendment to the German Fertilizer Ordinance was adopted at a special meeting of the Federal Council on March 27, 2020.
  - 20% reduction of fertilizers in the “red areas” from 2021
- A nationwide regulated and binding scheme for determining fertilisation requirements for nitrogen on arable land and grassland.

# Specific policy changes in German Fertilizer Ordinance

- Nitrate requirement values linked to an average yield are taken into account as the basis for the determination.
- phosphorus will also have to be balanced according to certain criteria and at the same time the permitted overhangs from the previous 20 kg / hectare to 10 kg / hectare will be reduced over a six-year average.
- The period of prohibition for spreading solid manure of hoof and clawed animals and compost was extended from 4 to 6 weeks (1 December - 15 January).
- The blocking period for manure from hoof and clawed animals and compost will be extended to 3 months in polluted areas throughout the country.
- So far, the regulation of the closed period only referred to fertilizers with a significant nitrogen content (> 1.5% in dry matter), but now the phosphate content (> 0.5% in dry matter) is also used.
- The requirements in nitrate-polluted areas have also been tightened up and will apply from 1.1.2021. For example, the "170 kg N regulation" is not based on the farm average but on the individual field.
- .....

# Costs for the new regulations

- Heavy administrative costs
  - Record all applications of fertilizers in details
- Increasing the difficulty of Biogas plants
  - 9,000 biogas plants in Germany
  - Disposal of slurries
- Potentially change agricultural production structure
  - Livestock industries
  - Increasing land prices
- Increasing agricultural production costs
  - Reducing the efficiency of agricultural production
  - Farmers bear most of the costs, while the subsidies are not enough
- Harming competitiveness of agriculture
- Food price increases
- .....



**map 1:** partial phosphorus balance (animal excretion minus export by crops) in kg P<sub>2</sub>O<sub>5</sub>\*ha<sup>-1</sup> (without poultry manure)

# In addition to fertilizers, more regulations for

- Pesticides : already strictly regulated
- Herbicides, e.g. Glyphosate ban from 15 December 2022
- GM free zone
- Animal welfare
- Climate policies: humus in the soil
- Soil quality
- Biodiversity (Natura 2000 program)
- Landscape
- .....

# Conclusion remarks

- Green agriculture is beneficiary for the public
  - A correction for intensive agriculture
  - A pillar for Sustainable development
- The costs are huge and mostly born by farmers
  - Political bargaining power is weak due to small population
- Possible increase in food prices
  - Costs for the poor
- More discussion with and more support for farmers
  - Balance conservative and development
- China could learn from them!
  - Reducing the learning costs in the future



# Thanks for your attention!

- Look forward to your comments and suggestions!