



REPUBLIC OF SLOVENIA  
COURT OF AUDIT

# AUDIT REPORT

## Effectiveness of reducing nitrate concentration in waters

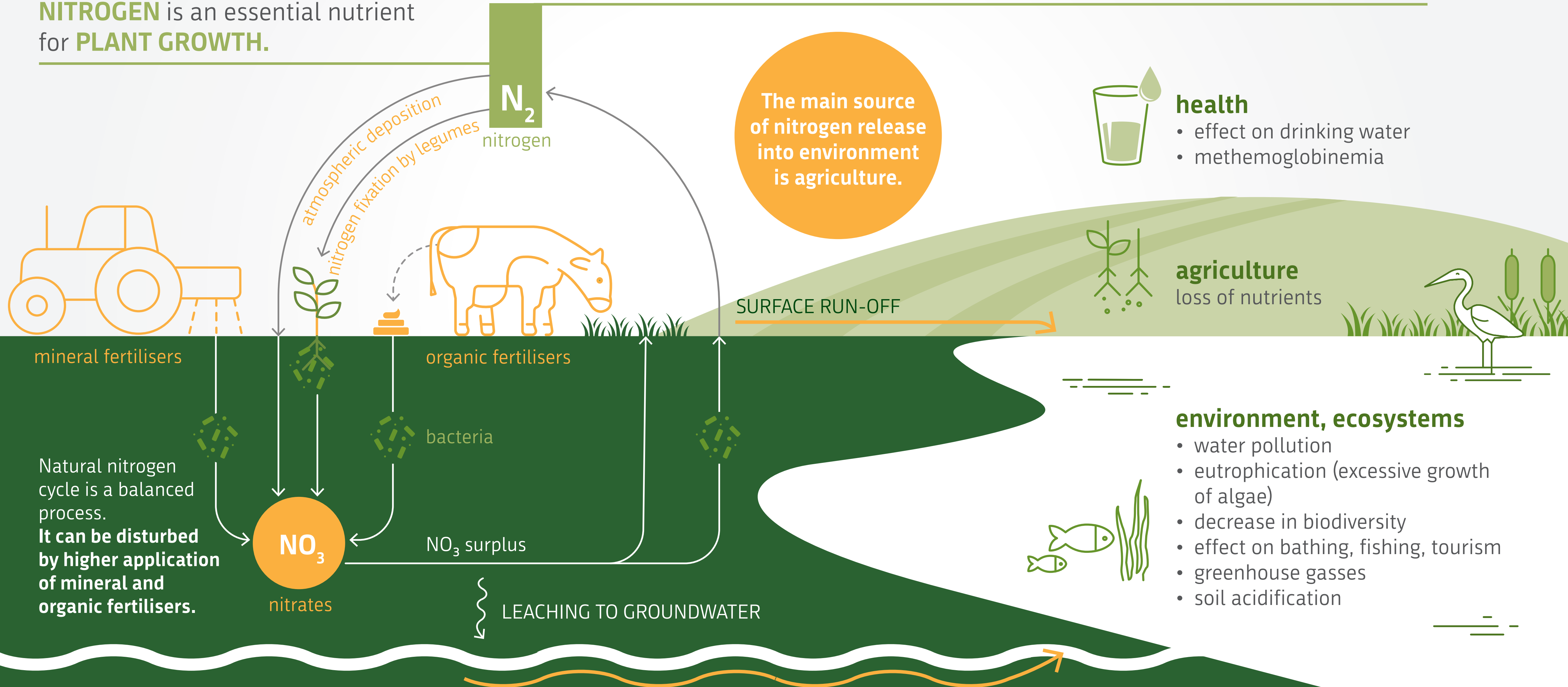
**Performance audit**

Audit period: 1 January 2014 to 31 December 2018



# Simplified nitrogen cycle

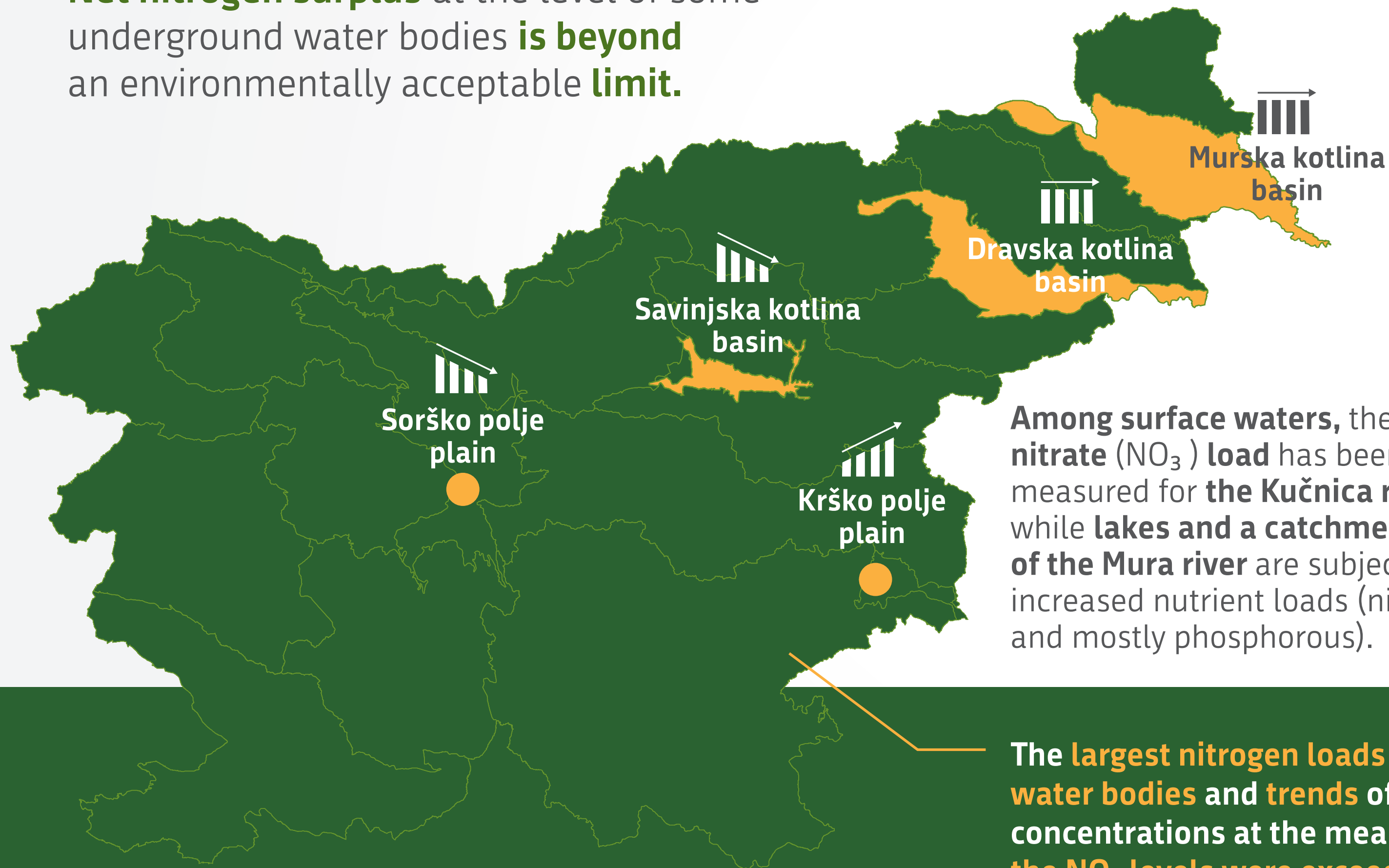
**NITROGEN** is an essential nutrient for **PLANT GROWTH**.



## NEGATIVE EFFECTS OF EXCESSIVE NITROGEN AMOUNTS

# Excessive nitrate levels in water

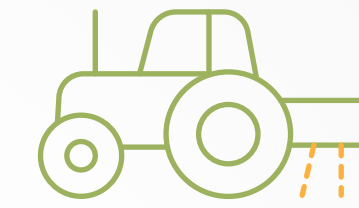
In general, **Slovenia releases into environment more nitrogen than can be used by plants. Net nitrogen surplus** at the level of some underground water bodies **is beyond** an environmentally acceptable **limit**.



Among surface waters, the largest nitrate ( $\text{NO}_3$ ) load has been measured for the **Kučnica river**, while **lakes and a catchment area of the Mura river** are subject to increased nutrient loads (nitrates, and mostly phosphorous).

The largest nitrogen loads carried by underground water bodies and trends of increase/decrease in  $\text{NO}_3$  concentrations at the measurement points where the  $\text{NO}_3$  levels were exceeded in 2018.

## REASONS



### nitrogen emissions from agriculture

- decreasing trend in net nitrogen surplus has slowed down in the last 10 years
- nitrogen surplus per agricultural holding is not monitored



### soil properties – not sufficiently known

- data from soil analysis and nitrate quick tests not collected in a central database
- no soil monitoring that should enable planning of relevant measures



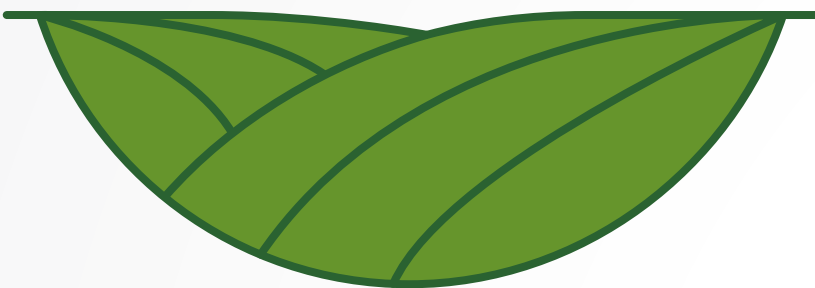
**weather conditions** (e.g. drought)  
**poor plant growth**, the plants are thus not able to use nitrogen

At least in some areas the **NITROGEN INPUT SHOULD BE REDUCED!**

# Implementing measures for reducing nitrate concentration in waters

at least  
**486,326 ha** of land

implementation of measures on 460,089 ha is a **condition for subsidy payments**



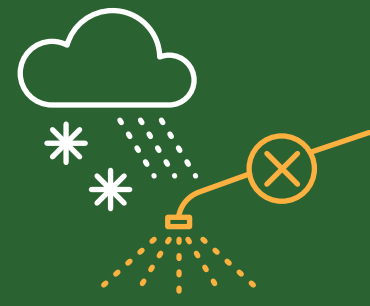
## MEASURES provided for in DECREE ON NITRATES

**mandatory measures** for all agricultural holdings that use fertilisers or produce livestock manure, compost and digestate

Provide minimum environmental protection



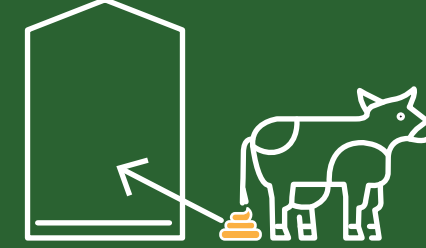
use of fertilisers **considering the needs** of plants and **even fertilisation**



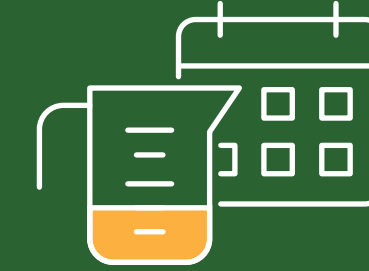
**fertilisation prohibition period**



**fertilisation rules** (flooded ground, vicinity of watercourses, sloping land, etc.)



**sufficient capacity and construction** of livestock manure storage



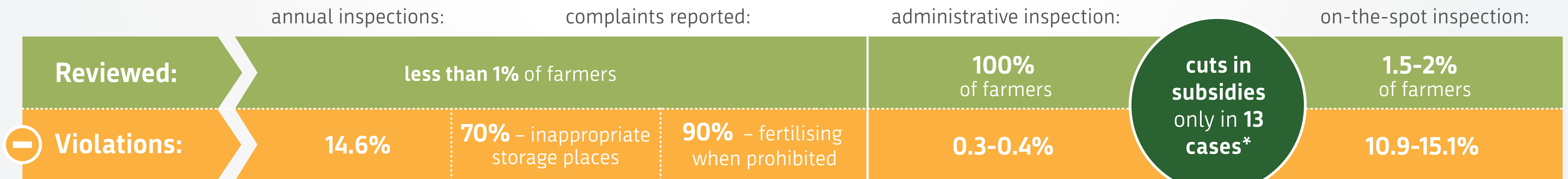
170 kg N/ha is the highest **allowed annual nitrogen input** from livestock manure



**possible additional restrictions** on vulnerable areas

### Inspectorate for Agriculture, Forestry, Hunting and Fisheries

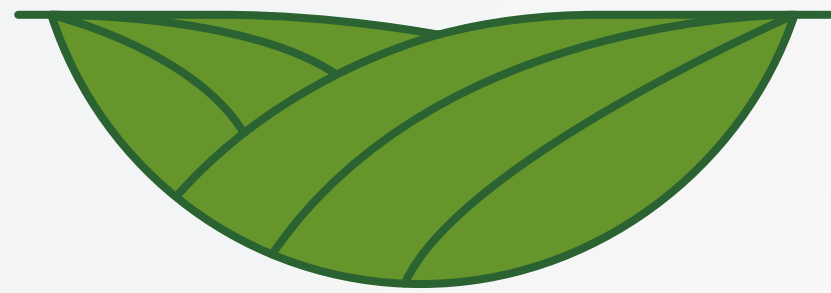
### Agency for Agricultural Markets and Rural Development



\* due to non-compliance with the decree on nitrates in the period 2014-2018



121,464 ha  
of land



## RURAL DEVELOPMENT PROGRAMME MEASURES

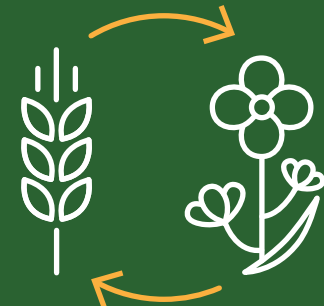
**Voluntary measures** undertaken against payment

- agri-environment-climate (AEC) payments
- organic farming

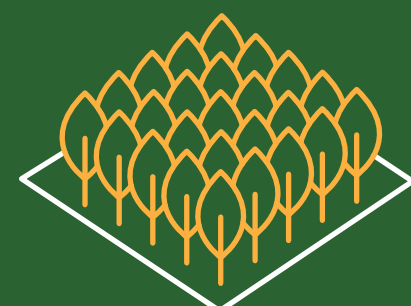
Additionally mitigate impacts of agricultural policy



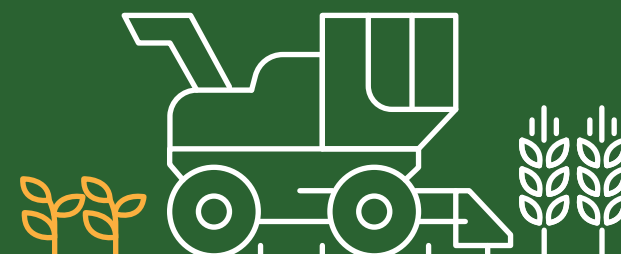
nitrate quick soil tests



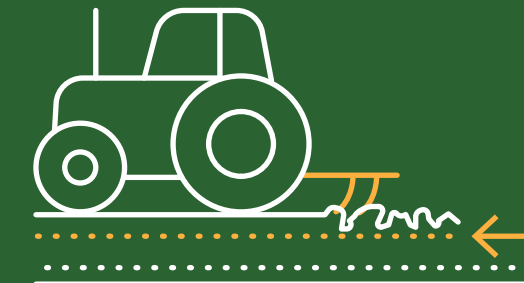
crop rotation



plant cover



green fertilisation



conservation tillage

### Agency for Agricultural Markets and Rural Development

administrative inspections and on-the-spot inspections

Number of reviews per year:

632 agricultural holdings (AEC payments)

460 ecological farms



Most often detected violations:

- livestock numbers approved per ha
- fertilising plans and soil analysis
- records on the use of fertilisers

## OTHER MEASURES

### MEASURES PERTAINING TO WATER PROTECTION AREAS

0.3%

Protection of drinking water against microbiological pollution

of agricultural land

- violations at 0-9% of reviewed farmers per year

### BIOGAS PLANTS AND COMPOSTING PLANTS

Only the use of **compost/digestate of quality class I** is allowed on agricultural land

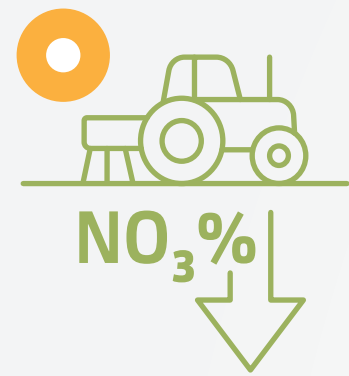
- environmental **permits are not always harmonised** with the amended legislation
- **poor control over the quality** of compost or digestate

### MEASURES FOR THE AREAS WITH POOR WATER STATUS AND FOR ECOSYSTEMS PROTECTION AREAS

- **Lack of stricter measures**

# Impacts of measures and innovative approaches

Strategically, major changes in agricultural practices are not foreseen



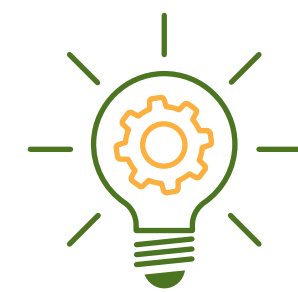
**Nitrogen surplus from agriculture is being reduced**, but in the last 10 years less intensively.



**Impacts** of an individual agricultural measure to reduce the level of nitrate in water **are not known**.



**Results** of water monitoring **do not show only the impacts of the agricultural policy**.



## INNOVATIVE APPROACHES

TRANSFER OF KNOWLEDGE	RESEARCH	RURAL DEVELOPMENT PROGRAMME MEASURE – COOPERATION
<ul style="list-style-type: none"> <li>no innovative measures – only counselling about appropriate implementation of already existing measures</li> <li>no master farms – provisions not implemented yet</li> </ul>	<ul style="list-style-type: none"> <li>financing of projects that could have an impact on the reduction of nitrate concentration in waters</li> <li>recommendations of already implemented projects not followed – reducing the organic fertiliser application in the problem areas</li> </ul>	<ul style="list-style-type: none"> <li>financing of pilot and joint projects</li> <li>both were published late</li> </ul>



## OPEN ISSUES

- ? looking for additional innovative solutions in the narrow areas that are problematic for decades
- ? looking for solutions per individual agricultural holding
- ? improving control (focusing on problem areas, repeated inspections of violators)
- ? increasing financing of education and transfer of knowledge

# OPINION OF THE COURT OF AUDIT



The Republic of Slovenia (Ministry of the Environment and Spatial Planning and Ministry of Agriculture, Forestry and Food) was **partially effective** in reducing nitrate concentration in waters in the period covered by the audit.

## IMPLEMENTED MEASURES:

- **Ministry of the Environment and Spatial Planning** developed **a plan of activities to harmonise environmental permits** of biogas plants and composting plants with legislation.
- **Inspectorate for the Environment and Spatial Planning** started in 2020 to implement **inspections of the important nitrate sources, mainly biogas plants and composting plants** in Dravska kotlina basin and Murska kotlina basin.
- **In the karst area fertiliser storage capacities were reviewed** in 2018 by the Inspectorate for Agriculture, Forestry, Hunting and Fisheries and in 2019, the **nitrate sources were reviewed** by the Inspectorate for the Environment and Spatial Planning.

## RECOMMENDATIONS:

### Ministry of Agriculture, Forestry and Food

- **Altering agricultural practices** in the problem areas
- **Promoting** better inclusion of farmers in measures

### Joint

- **Continuing with controls** over the problem areas
- **Linking data** from the field of environment and agriculture also for monitoring the effects of measures

### Ministry of the Environment and Spatial Planning

- **Directing** nitrate protection measures to the problem areas
- More frequent **use of fertilising plans**
- **Improving control** over the biogas plants