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Implementation of Nitrate Directive to Poland

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ABSTRACT

In the paper the present state of implementation of three main resolutions of Nitrate Directive is presented. Polish Code of GAP has been prepared already in 1999 in collaboration with Danish Advisory Service in Agriculture and after approval by Ministry of Agriculture and Rural Development and Ministry of Environment, disseminated in several thousands copies. The 21 vulnerable zones have been established in 2004 by Regional Water Management Boards covering 6263 km² i.e. 2 % of Polish territory. Action programmes have been prepared for each vulnerable zone separately and the implementation of these programmes is in progress. The case study for one vulnerable zone was included.

Key words : nitrate directive, code of good agricultural practice, vulnerable zones, action programmes

IZVLEČEK

IZVEDBA NITRATNE DIREKTIVE NA POLJSKEM

Članek obravnava stopnjo implementacije treh glavnih resolucij Nitratne direktive na Poljskem. Poljski kodeks dobre kmetijske prakse (DKP) je bil pripravljen že leta 1999 v sodelovanju z Dansko kmetijsko svetovalno službo. Po potrditvi na Ministrstvu za kmetijstvo in razvoj podeželja ter Ministrstva za okolje je bil v več tisoč izvodih razposlan na ustrezne naslove. Skupno 21 ranljivih območij Poljske meri 6263 km², kar znaša 2% površine države. Za vsako ranljivo območje je bil pripravljen poseben akcijski program, ki se že izvaja. Na primeru izbranega ranljivega območja je prikazan postopek sanacije teh območij.

Ključne besede: nitratna direktiva, kodeks dobre kmetijske prakse, ranljive cone, akcijski program

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1 INTRODUCTION

It is a common belief that the main cause of water pollution in European countries including Poland, are nitrates and phosphates from agricultural sources. Poland is the country of low water resources and rivers falling to Baltic Sea drain almost 100 % of our territory. The main rivers are Wessel flowing across the whole country and Odra, the border river shared with Germany. Several small rivers fall directly to the Baltic Sea. The load of total nitrogen discharged with the rivers water is about $460 \cdot 10^3$ tonnes N and this of total phosphorus about $12 \cdot 10^3$ tonnes P yearly. According to estimation 45-50% of nitrogen and 30-35 % of phosphorus originate from agriculture. Of the total area of the country ($330 \cdot 10^3 \text{ km}^2$) 93 % is classified as the rural area of which 54 % is agricultural land and 29 % forests. On this area about $1950 \cdot 10^3$ farm holdings are operating and it is inhabited by 38 % of the total population. The substantial share of farm holdings is poorly equipped with water facilities and manure pits. About 40 % of farms still use the water from shallow wells and only 10 % are connected to sewage system. Animals are kept almost exclusively on straw beds but half of the farm holdings only are provided with manure plates. The production and consumption of fertilisers is rather moderate and on average 160 kg NPK are applied annually per ha of agricultural land including 70 kg NPK from farmyard manure and 90 kg NPK from mineral fertilizers. From the above it can be concluded that nitrogen and phosphorus from agriculture could be both the diffuse (from agricultural land) and point source (from farmholdings) origin.

Since 1990 year the state, countrywide system of water monitoring for pollution with mineral and organic substance is carried on. The results show that concerning nitrates the surface waters (rivers) are generally clean. In less than 0,4 % of monitoring points the content of nitrates was above the limit set by Nitrate Directive ($50 \text{ mg NO}_3 \cdot \text{dm}^{-3}$ water) and in less than 0,3 % of points the concentration of nitrate was in the range $40\text{-}50 \text{ mg NO}_3 \cdot \text{dm}^{-3}$. Not so optimistic is the situation with respect to sub-surface and particularly to ground waters (Table 1). The positive tendencies in the last 5 years are clearly visible but one must remember that shallow, practically ground waters are still the main source of drinking water for about 40 % of farmholdings.

Table 1. Pollution of sub-surface waters with nitrate in Poland

Concentration of nitrates		Percent [%] of date	
		in 1996 y	in 2001 y
Sub-surface waters	25 –50 mg $\text{NO}_3 \cdot \text{dm}^{-3}$	9.2	7.4
	above 50 mg $\text{NO}_3 \cdot \text{dm}^{-3}$	15.0	9.8
Deep waters	25 –50 mg $\text{NO}_3 \cdot \text{dm}^{-3}$	3.0	2.0
	above 50 mg $\text{NO}_3 \cdot \text{dm}^{-3}$	3.7	2.0
Ground waters	25 –50 mg $\text{NO}_3 \cdot \text{dm}^{-3}$	14.1	12.1
	above 50 mg $\text{NO}_3 \cdot \text{dm}^{-3}$	24.8	16.7

However about 50 % of lakes situated in the agriculturally managed areas show the symptoms of eutrophication due mainly to the excessive concentration of phosphorus and to bottom deposits rich in organic substances.

2 NITRATE DIRECTIVE

Nitrate Directive [Directive 91/676/EEC] was set in 1991 with two main objectives:

- reducing water pollution caused or induced from agricultural sources,
- preventing further such pollution.

According to this Directive waters affected by pollution or waters which could be affected are waters containing more than 50 mg NO^{*}dm⁻³ or could contain more than this amount if proper counter-actions would not be taken. The Member States were obliged in two-year period following the notification of Nitrate Directive to undertake the following resolutions:

- establish the code(s) of good agricultural practice,
- designate the vulnerable zones, i.e. areas of land which drain into the waters affected by pollution or which could be affected by pollution,
- establish action programmes in respect of designated vulnerable zones.

In Poland the implementation program for Nitrate Directive has been prepared already in year 1999. According to the agreement with European Commission the rules of this Directive should have been implemented to Polish legislation until 2002, the vulnerable zones designated until 2003 and the action programmes for these zone established until 2004 i.e. accession of Poland to UE. All these terms were kept. The rules of Nitrate Directive have been translated into several acts and decrees (Tab. 2).

Table 2. Main acts and decrees in pursuance of Nitrate Directive

Legal acts		
1	Act of 27 April 2001. Environment protection law.	Journal of Laws from 2001, no. 62, p. 627
2	Act of 18 July 2001. Water act.	Journal of Laws from 2001, no. 115, p. 1229.
3	Act of 27 April 2001 regarding waste.	Journal of Laws from 2001, no. 62, p. 628
4	Act of 26 July 2000 on fertilisers and fertilisation	Journal of Laws from 2000, no. 89, p. 991
5	Act of 16 March 2000 regarding ecological agriculture	Journal of Laws from 2001, no. 38, p. 452
6	Act of 12 July 1995 regarding protection of cultivated plants, with further amendments	Uniform text, Journal of Laws from 1999, no. 58, p. 349
Decrees		
1	Decree of the Minister of Agriculture and Rural Development of 1 June 2001 on detailed methods of applying fertilisers and conducting fertilisation training	Journal of Laws from 2001, no. 60, p. 616
2	Decree of the Minister of Environment of 23 December 2002 on criteria of designating Vulnerable Zones subjected to pollution by nitrate from agricultural sources	Journal of Laws from 2002, no.241, p.2093
3	Decree of the Minister of Environment of 23 December 2002 on action programme aimed at limitation of nitrogen outflow from agricultural sources	Journal of Laws from 2003, no4, p.44

In 1999 the first Polish Code of Good Agricultural Practice has been prepared by the Institute of Soil Science and Plant Cultivation in Puławy in scope of twin project with the Danish Agriculture Advisory Centre in Skejby.

3 POLISH CODE OF GOOD AGRICULTURAL PRACTICE

The first draft of the Polish Code of Good Agricultural Practice was published in 1999 in a limited number of copies and became the subject of evaluation by the Agricultural Advisory Centres in Poland. In 2000 the Scientific-Technical Conference was organised by the Institute of Soil Science and Plant Cultivation under the title " Good agricultural practices " in order to fulfil the obligations of Nitrate Directive focused on promoting the Code application among the advisers and farmers. European Commission was provided with the English version of this Code. The next full-fledged edition of the Code, with all-necessary amendments and improvements, was published in 2002 by the Foundation of Aid Programmes for Agriculture (FAPA) and got the official approval of the Ministry of Agriculture and Rural Development and Ministry of Environment. This version of the Code [Code 2002], supplemented if necessary is still in circulation being implemented by farmers on a voluntary basis except the farmers in vulnerable zones where it is obligatory. Polish Code of GAP covers all items listed in Annex II A to the Nitrate Directive and contains 8 chapters and several annexes (Table 3).

Table 3. The contents of Polish Code of good agricultural practice

Chapter, Annex	Title	Contents
A	Legislation on environment protection	Acts and decrees as in Table 2
B	Farm organisation and management	Planning of agricultural area, organisation of plant and animal production, balance of SOM and nutrients, integrated plant protection
C	Water protection	Protection of water against pollution from point sources, protection of water against pollution from diffuse sources
D	Protection of agricultural land	Protection of soil against erosion, protection of soil against chemical pollution, protection of soil against biological degradation
E	Protection of air	Dust and smoke, ammonium and glasshouse gases, odour substances
F	Protection of landscape and preservation of biodiversity	Situation of farmholding in landscape, biodiversity at the farm
G	Infrastructure of rural areas	
H	Summary of principles of GAP for implementation of Nitrate Directive	Excerpts from recommendations and requirements described in the Code

In 2003 the most important items (including all required by Nitrate Directive) were extracted from the "big" or "mother" Code, edited in more easy way and published as so called Ordinary GAP [2003]. This "Small Code" was made obligatory for all farmers in less favourite areas (LFA), farmers participating in rural environmental programmes and farmers covered by aid programme for underdeveloped farmholdings. Small Code like the "big" ones is split into 8 chapters (Table 4).

Table 4. The contents of Small Code of GAP

Chapter	Title and content of the chapter
1	Production, storage and application of manure
2	Principles of sewage sludge utilisation in agriculture
3	Application of pesticides
4	Grassland management
5	Protection of environmental habitats
6	Cleanliness and organisation of farmholding
7	Soil protection
8	Water protection

4 VULNERABLE ZONES

In Poland Ministry of Environment bears the whole responsibility for a water management on the territory of the country. This task is accomplished through the Regional Water Management Boards, which in number of 6 cover with its activities the whole Poland. No wonder that the tasks of designation the vulnerable zones and establishing the action programme was entrusted to these Boards. In 2004 altogether 21 vulnerable zones on the area of about 6263 km² (i.e. round 2 % of Polish territory) have been designated (Tab 5). It has been done on the basis of decrees issued by the Directors of the Boards and published in the Regional Journal of Laws. The whole documentation has been sent in April 2004 to the European Commission.

For each vulnerable zone the specific action programme has been prepared and, after consultation with local authorities and farmers organisation, approved by the Director of Board and published in Regional Journal of Law. From April 2004 on these programmes became obligatory and the process of its implementation to the agricultural practice has started. This process will last until 2008 i.e. four years since Poland accession to UE.

The general aim of all programmes is to improve the measurable parameters of the environment and restore the good standards of surface and underground water quality, particularly waters used for drinking purposes. The priority is given to eliminate all errors in storage and application of fertilizers, particularly manure. Provision of training and information for farmers, promoting good agriculture practices is included to all programmes focused on raising farmer's sensitivity to protection of the environment. All institutions dealing with advisory service, particularly Centres of Advisory in Agriculture and Chemical Laboratories are charged with these tasks. The recognition of pollution sources is in foreground of all advisory activities. The programmes are supplemented with control measures on farms for which the workers of Regional Boards of Environment Protection are authorised.

A very important part of these programmes is monitoring of the soil and water for nitrates content in vulnerable zones. The results of this monitoring will be important for comparing the status of environment at the beginning and at the end of four-year programme and estimating the efficiency of measures that have been undertaken. The most important measures for which all farmers are obliged to apply are listed as follows:

Table 5. The vulnerable zones in Poland

Region of water management and main river	Catchment of the river and/or lake	The area of zone	
		km ²	% area of region
Gdańsk Lower Wisła	Rivers: Kotomierzycza, Struga Żaki, Lakes: Kornatowskie, Płużnickie, Wieczno Południowe, Wieczno Północne	721.70	2.03
Warszawa Middle Wisła	Rivers: Zgłowiączka, Sona * Wells in villages: Doba, Ludwin, Przegaliny Duże, Pniewnik	575.50	0.5
Szczecin Lower Odra and the rivers of Przymorza	River Płonia	1098.70	5.36
Wrocław Middle Odra	Rivers: Orla, Rów Polski Underground water reservoir GZWP 327	2823.31	7.14
Gliwice Upper Wisła and Upper Odra	Rivers: Troja, Psina, Cisek	317.14	4.07
Poznań River Warta	Rivers: Koplą, Pogona, Dąbrówka, Sama, Olszynka, Samica Stęszewska, Mogilnica, Rów Racocki, Lakes: Chrzypskie, Radziszewskie	726.90	1.33
Summary		6263.25	

* see case study

- keeping the periods when application of fertilizers is not recommended or forbidden
- abiding the principles of applying fertilizers on the slopes and in the vicinity of streams and water reservoirs
- abstaining from fertilizers application on the soils soaked or covered with water, frozen and covered by snow
- proper storing of manure on solid plates or in tight tanks of appropriate capacity for 6 months period
- following the recommendation for sustainable nutrients management and keeping records on fertilizers application
- structuring the agricultural land in line with GAP taking into consideration crop rotation on arable land and good management practices on grassland

The drafts of the action programmes, before making them obligatory were presented to the farmers and already in this stage raised many questions and objections. Particularly sensitive were the actions demanding financial input of the farmers like building the manure pits and/or tanks and connecting the house to the sewage system. In course of several meetings and discussion the farmers were made aware of the possibility to apply for the financial support in scope of structural programmes launched in agreement with UE. That helped a lot to overcome the reluctance of farmers and eventually all 21 action programmes have been accepted by local

communities and for already 1.5 year are in the stage of implementation. The best way to introduce the last 1.5 year activities in scope of implementation the action programmes would be to present a case study.

5 CASE STUDY FOR IMPLEMENTATION ACTION PROGRAMMES

Vulnerable Zone in catchment of river Sony (see Tab. 5). The Zone covers the territory of the districts Ciechanów and Pułtusk in voivodship Mazoowieckie on the total area of 406 km². In the period July-December 2004 the meetings have been organised for the farmholders with participation of the representatives of units engaged in the action programme. These units are: Commune Councils, Local Agrochemical Laboratory, Advisory Centre for Agriculture, Regional Environment Protection Board, and Regional Water Management Board. All farmers were provided with Code of Good Agricultural Practice, the leaflet on the action programme and other printings concerning the situation of this area.

Commune Councils prepared the preliminary lists of farmholdings posing the potential treats for the environment in line with the criteria stated in action programme. The preliminary lists included 939 farmholdings which have been thoroughly examined on the spot by the advisers of Advisory Centre and Agrochemical Laboratory. In the period November 2004 - February 2006 the special body including the representatives of the units mentioned above, taking into account the results of this examination verified the lists and eventually qualified 644 farmholdings which could contribute to the pollution of waters with nitrates. These final lists were send to all units involved in pursuing the action programme in this vulnerable zone of river Sona.

Commune Councils established the yearly programme for the provision of training and information for farmers, promoting the principles of GAP and other measures made obligatory in the zone. In the period May 2004 - April 2005 altogether 19 short courses and training have been performed by the advisers from Advisory Centre and Agrochemical Laboratory. The farmers were accustomed with all obligations resulting from farm management in vulnerable zone and informed about the possibility to get the financial support for providing the farm with necessary instalments focused on protection of environment, particularly the manure pits and tanks. In the course of these meetings the detailed recommendations concerning good agricultural practice were given as well. Until the end of 2005 about 100 manure plates and liquid manure tanks were build thanks to the financial support from structural programmes of UE.

Regional Board for Environment Protection, Regional Agrochemical Laboratory and Regional Station for Sanitary Control are performing soils and water monitoring for the content of nitrates. Water samples were collected every month in 4 measuring sites from river Sona. The content of nitrates was in the range 0,18 - 96,5 mg NO₃ *dm⁻³ and 9 samples showed the nitrates content exceeding the limit set by Nitrate Directive. The results are comparable to those from 1991 year. The monitoring of water from 29 wells feeding the local water pipes system showed that water sticks to all requirement for high quality drinking water. In 2005 the workers of Regional

Board for Environment Protection have controlled 34 farmholdings for preserving the principles of good agricultural practice.

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