

COST 869

Mitigation options for nutrient reduction in surface water and groundwaters

Report of Working Group 3

Meeting 18–19 May 2009

*Location: Hof van Wageningen, Lawickse Allee 9
Wageningen, The Netherlands*

Topic of the meeting:

Implementation of the WFD River Basin Management Plans (RBMP) Experiences and problems encountered



Local organizers

Oscar Schoumans & Wim Chardon

Report

Oscar Schoumans



agriculture, nature
and food quality



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This meeting is supported by
EU/COST 869

Dutch Ministry of Agriculture Nature and Food Quality (Res. BO-05-004; BO-05-001-003)
Wageningen University and Research

Report

Introduction

COST 869 (“Mitigation options for nutrient reduction in surface waters and groundwaters”; 2006-2011) was approved by the EC because there was an urgent need to bring together information from all over Europe with respect to effective strategies to reduce nutrient losses. The main reason was that the European countries were starting up implementation of the Water Framework Directive (WFD). The working groups of this COST action have been oriented on important specific issues of this WFD:

- Location of the hot spot areas as the driving forces for nutrient losses (WG1)
- Ecological consequences of nutrient losses for different water bodies (WG2)
- Evaluation of mitigation options in terms of cost-effectiveness (WG3)
- Experimental data of mitigation options at catchment scale (WG4)

In the last two years much information was gathered about the effectiveness of different mitigation options and this is still under further development. However, in the mean time the EC member states have developed their tentative first River Basin Management Plans (RBMP). It was therefore important that at short term information was exchanged regarding the preliminary scientific results of our inventory and studies and the outcome of the process that has led to the set up of the first RBMP.

Scope of the workshop

The major objectives of the workshop were:

- To explore the methodologies used by the EC member states to derive measures for specific (rural) areas to reduce nutrient losses.
- To determine which information was missing to set up a more accurate and effective first RBMP.
- To explore which types of measures are available that would have perspective to reduce nutrient losses under different circumstances.
- To conclude what needs to be done to collect the missing information in the next years.

The complete program of the workshop is presented in Annex 1

Participants

Representatives of 22 countries visited the meeting. A complete list of all 41 participants is shown in Annex 2. The meeting was held at the Congress Centre “Hof van Wageningen” in Wageningen, The Netherlands.

Main outcome of the sessions

On the first day (18 May 2009) the intercomparison of the RBMP of different European countries was presented and discussed. A total of 13 studies were presented from all over Europe: 3 from Northern Europe (Norway, Sweden, Finland), 4 from Western Europe (The Netherlands, England/Wales, Scotland, and France), 3 from Central Eastern Europe (Austria, Germany, Czech Republic) and 3 for the South of Europe (Greece, Portugal and Spain).

In many countries the River Basin Management Plans are still tentative. However, during the meeting it became clear that reduction of the diffuse nutrient losses from agricultural land is regulated by means of the Action Plans (implementation of the Nitrate Directive). The action plans are an effective measure, because the balance surpluses of nutrients are reduced while there no agronomical negative aspects are observed" However, it seems that in none of the countries additional measures (with respect to agricultural) were included beyond the Action Plans in order to improve the water quality any further. Furthermore, the effectiveness of the measures in the Action Plans were most of the time not proved by means of field experiments under different circumstances. Finally, many countries expect that the water quality will not improve at the short term because the response time depend on to the time required to reduce the source magnitude, the length of the hydrological pathway from source to receptor and the lag in biological response in waterbodies due to recolonisation etc of species no longer found in the water body.

In the morning of the second day (19 may 2009) the effectiveness of special groups of mitigations options was discussed and introduced by a discussion on the conceptual framework in which mitigation options should fit in. The first group of mitigation options was related to the management on farm scale (adjusted P recommendations, impact of catch crops and mining, and

an Irish approach of agri-environmental schemes for farmers). A second session was related to erosion, wetland restoration and river restoration. In the afternoon of the second day the posters were presented and the meeting was closed with a general discussion on what have we learned and what to do further, including suggestions for follow up meetings (to be discussed and approved by the management committee).

Our consumption pattern (society) has led to production systems which are not in balance anymore with respect to nutrients. In many countries more nutrients are used than is required for sufficient production. Recommendations need to be adjusted, because the nutrient status of the soils and the size of different nutrient pools have changed over time. If the current biological responses are taken into account the fertilization can mostly be reduced remarkably. Often, the amount of manure-P is sufficient and there is no need to add P fertilizers. In some countries the amount of nutrients in agricultural soils is at such a level that even no manure needs to be applied for a certain time. Mining can be an important strategy to reduce the P status and therefore directly reduce the P losses by overland runoff and erosion. However, the reduction in P losses by leaching will depend also on the amount of P in the subsoil. Catch crops seem to be one of the most important ways to reduce nitrogen losses.

Catch crops are also important to reduce erosion. Soil coverage, terracing, under sown crops to maize, buffer strips are also important, although there is no much data of the effectiveness under different conditions on catchments scale. There is much discussion about the effectiveness of conservation tillage on arable land.

Reconstructed wetlands are very useful for N removal. There is much doubt about the effectiveness in P removal. Sometimes a reconstructed wetland can act as a P-source instead of a P-sink.

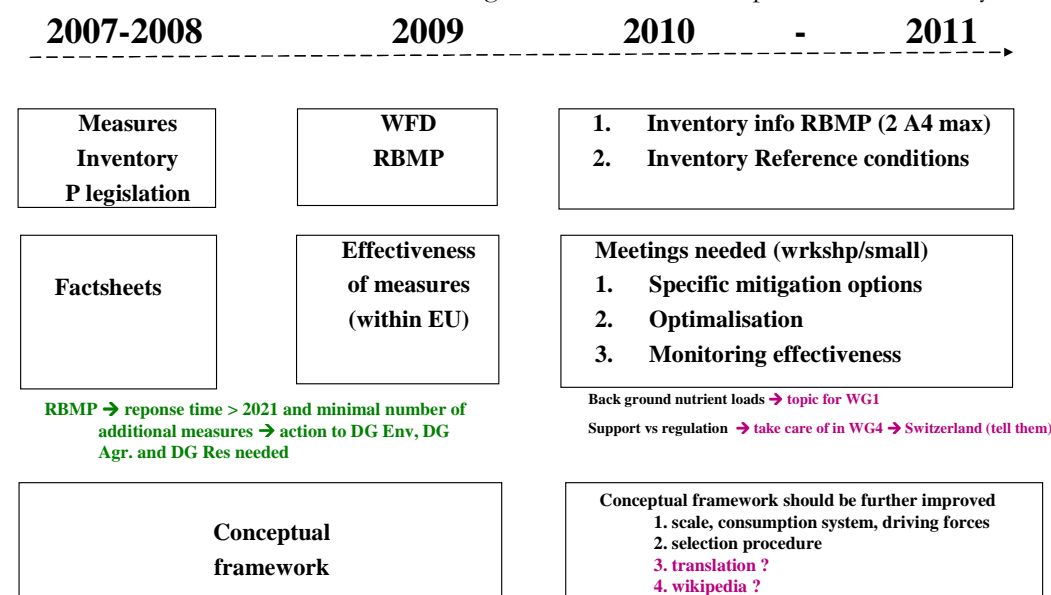
Danish experience with active river restoration (25 years) showed that the ecological benefit was not more than without active measures (no real maintenance of the river). 125 river restoration projects were followed where the natural hydrological interaction between river and floodplain was restored (actions: removing barriers, spanning grounds, re-meandering, weed cutting, buffer strips, wetland restoration, buffer zone). In Denmark it was concluded that restoration of the small streams gives both more km and more ecological value for the same costs; small streams are the heart of river systems. The river network in Europe consists of about 12 million kilometres of rivers and at least 80% of them are small (1st and 2nd order streams). Such rivers are commonly known as headwaters, creeks, streams or brooks and from an ecological point of view they are extremely valuable by providing habitats for a wide range of plants and animals and their colonization potential for the river continuum are invaluable.

With respect to the conceptual framework it was concluded that, as proposed, not only physical aspects should be taken into account but also more the driving forces and management aspects. Furthermore, a decision tree for policy makers to select relevant measures would be very valuable. It would be very nice if the small discussion group could bring up such a tool.

More information about this meeting is available on the website <http://www.cost869.alterra.nl/>
Also the proceedings and the presentations of the workshop can be downloaded from this website

Suggestions for future activities

Based on the final discussion the following actions seem to be important in the nearby future:



Annex 1 AGENDA

Sunday 17 May 2009

19:00 – 20.30 Registration (lounge) and welcome drink (sports bar, basement)

Monday 18 May 2009

08:00 – 08.40 Registration
08:40 – 08.45 Welcome and announcements *Oscar Schoumans, The Netherlands*
08:45 – 09.15 *Maartje Oonk, Ministry of Agriculture, Nature and Food Quality The Netherlands.*
Implementation of the WFD in the Netherlands

Western Europe

09:15 – 09.45 *UK, Marc Stutter:* Experiences in a Scottish research catchment: Monitored Priority Catchment Project, Lunan Water.
09:45 – 10.15 *UK, Martyn Silgram:* Recent research supporting the development of RBMPs and targeted implementation of the Water Framework Directive in England and Wales.
10:15 – 10.45 *France, Wilfrid Messiez-Poche, Chantal Gascuel:* A local French initiative for water management at the basin scale.

10:45 – 11.15 Tea and Coffee (downstairs)

Northern Europe

11.15 – 11:45 *Sweden, Martin Larsson:* RBMP for the North Baltic river basin district in Sweden - location of hot spot areas, mitigation options and effects.
11.45 – 12:15 *Finland, Tom Frisk:* Achieving the environmental goals of the WFD in Finland and the role of agricultural water protection measures.
12.15 – 12:45 *Norway, Håkon Borch:* Modeling mitigation effects on agriculture run off, and tools for choosing strategies in the implementation of the WFD in Norway.

12.45 – 14.00 Lunch

Central and Eastern Europe

14.00 – 14.30 *Austria, Matthias Zessner:* Quantification of nutrient fluxes on catchment scale as basis for evaluation of the effectiveness of mitigations options in Austria and the Danube Basin.
14.30 – 15.00 *Germany, Michael Trepel:* Nutrient management in the Elbe basin – targets and measures.
15:00 – 15.30 *Czech Republic, Josef Hezlar:* Implementation of management measures against pollution of surface waters with nutrients from agriculture in the first RBMP of the Czech Republic

15.30 – 16.00 Tea and Coffee (downstairs)

Southern Europe

16.00 – 16.30 *Greece, Louis Vardakas / Rania Tzoraki:* The Greek Pilot River Basin Management Plan.
16.30 – 17.00 *Portugal, Jorge Pinheiro:* Eutrophication in the Azores islands.
17.00 – 17.30 *Spain, Antonio Delgado:* Nitrate and phosphorus in Spanish watersheds.

19.00 – 20.30 **Conference dinner at hotel**

Tuesday 19 May 2009

	Session 2
08.30 – 09.00	<i>Oscar Schoumans</i> : Conceptual framework for mitigation options.
09.00 – 09.30	<i>Eila Turtola</i> : Biologically adjusted P cycle as a measure to reduce P losses, an example for Finnish agriculture.
09.30 – 10.00	<i>Gitte Rubaek</i> : Impact of crop management on nutrient losses.
10.00 – 10.30	<i>Karl Richards</i> : Implementation of agri-environmental measures in Ireland: Case study of the Rural Environmental Protection Scheme.
10:30 – 11.00	Tea and Coffee (downstairs)
	Session 2 Continued
11.00 – 11.30	<i>Peter Strauss / Antonio Delgado</i> : Soil erosion control measures, effectiveness and implementation strategies – the case of Spain and Austria.
11.30 – 11.45	<i>Jaroslav Antal</i> : Soil water erosion in Slovakia - Problems and solutions.
11.45 – 12.15	<i>Iggy Litaor</i> : Wetland restoration of marginal arable land: A Mediterranean experience.
12.15 – 12.45	<i>Brian Kronvang</i> : River restoration: Long term experiences from Denmark.
12.45 – 13.45	Lunch
13.45 – 14.45	Poster session , authors are asked to be present beside their poster Tea and Coffee will be available in conference room
14:45 – 16:30	Discussion <i>We would appreciate receiving items for the discussion via email before the meeting, or upon registration at the beginning of the meeting</i>
16:30	Close, drink

POSTERS

1. *Emir Bilaletdin, Finland*: Experiences of using different calculation methods concerning the RBMB work in Finland.
2. *Peter Csatho, Hungary*: Critical evaluation of the first 15 years of the Nitrate Directive - results, failures and urgent tasks.
3. *Sarah De Bolle, Belgium*: River basin management plan for the River Scheldt in Flanders.
4. *Marius Heinen, The Netherlands*: Experimental determination of the effectiveness of unfertilized grass buffer strips in the Netherlands.
5. *Klaus Isermann, Germany*: Actual and future needed contributions of Sciences and Policy in Germany regarding the implementation not only of the RBMP of the EU-WFD for reducing impact of agricultural losses of the nutrients C, N, P, (S) in river basins / catchments.
6. *Gert-Jan Noij, The Netherlands*: Surface runoff of phosphorus from flat fields.
7. *Francisca Sival, The Netherlands*: Phosphorus retention by a constructed wetland.
8. *Dimitranka Stoicheva, Bulgaria*: Leaching of nitrate nitrogen under different growing crops and nitrogen rates from Fluvisols of Southern Bulgaria.
9. *Caroline van der Salm, The Netherlands*: Phosphorus and nitrogen losses from a grassland site on a heavy clay soil in a fluvial plain in the Netherlands.

Annex 2 LIST OF DELEGATES

Austria	Matthias Zessner	mzessner@iwag.tuwien.ac.at
Austria	Peter Strauss	peter.strauss@baw.at
Belgium	Sarah de Bolle	sara.debolle@ugent.be
Bulgaria	Dimitranka Stoicheva	dstoicheva@abv.bg
Czech Rep.	Klara Cechova	cechova@vrv.cz
Czech Rep.	Josef Hejzlar	Josef.Hejzlar@seznam.cz
Denmark	Brian Kronvang	bkr@dmu.dk
Denmark	Gitte Rubæk	Gitte.Rubaek@agrsci.dk
Finland	Emir Bilaletdin	emir.bilaletdin@ymparisto.fi
Finland	Eila Turtola	eila.turtola@mtt.fi
Finland	Tom Frisk	tom.frisk@ymparisto.fi
France	Chantal Gascuel	Chantal.Gascuel@rennes.inra.fr
France	Wilfrid Messiez-Poche	sage@pays-de-saintbrieuc.org
Germany	Michael Trepel	michael.trepel@llur.landsh.de
Germany	Klaus Isermann	isermann.bnla@t-online.de
Greece	Louis Vardakas	louisvard@gmail.com
Greece	Rania Tzoraki	rania.tzoraki@enveng.tuc.gr
Hungary	Istvan Sisak	talajtan@georgikon.hu
Hungary	Peter Csatho	csatho@rissac.hu
Hungary	Marton Vona	Vona.Marton@mkk.szie.hu
Ireland	Karl Richards	Karl.Richards@teagasc.ie
Israel	Iggy Litaor	litaori@telhai.ac.il
Netherlands	Wim Chardon	wim.chardon@wur.nl
Netherlands	Oscar Schoumans	Oscar.Schoumans@wur.nl
Netherlands	Frank van der Bolt	Frank.vanderBolt@wur.nl
Netherlands	Phillip Ehlert	Phillip.Ehlert@wur.nl
Netherlands	Gert-Jan Noij	gert-jan.noij@wur.nl
Netherlands	Caroline van der Salm	caroline.vandersalm@wur.nl
Netherlands	Maartje Onk	m.w.oonk@minlnv.nl
Netherlands	Olga Cleveringa	olga.cleveringa@rws.nl
Netherlands	Marius Heinen	marius.heinen@wur.nl
Norway	Tore Krogstad	tore.krogstad@umb.no
Norway	Håkon Borch	Hakon.Borch@bioforsk.no
Portugal	Jorge Pinheiro	jpinheiro@uac.pt
Slovakia	Jaroslav Antal	Jaroslav.Antal@uniag.sk
Slovakia	Jaroslav Noskovič	jaroslav.noskovic@uniag.sk
Spain	Antonio Delgado	adelgado@us.es
Sweden	Martin Larsson	Martin.H.Larsson@lansstyrelsen.se
Switzerland	Hans Ulrich Gujer	hans.gujer@bafu.admin.ch
UK	Marc Stutter	m.stutter@macaulay.ac.uk
UK	Martyn Silgram	martyn.silgram@adas.co.uk