

# From theory to practice: Identifying measures for reduced eutrophication together with farmers



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Action C6 in Rich Waters: Farm-level and catchment-level water plans for agriculture



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# Voluntary and mandatory measures to reduce nutrient emissions from agriculture

## Mandatory measures

### Measures related to storage and spreading of animal manures:

- Minimum storage capacity corresponding to 6 – 10 months of production
- Maximum 22 kg P ha<sup>-1</sup> yr<sup>-1</sup> and 170 kg N ha<sup>-1</sup> yr<sup>-1</sup>
- Closed period 1 November – 28 February
- Restricted period 1 – 31 October
- Restrictions for sensitive areas and periods (e.g. frozen ground)
- Restrictions on techniques for spreading

### Other measures:

- Requirement of green cover on 50-60% of arable land during winter

## Voluntary measures

### Funding of voluntary measures through EAFRD or LOVA:

- Wetland construction
- Structural liming of clay soils
- Buffer zones
- Catch crops
- Grass crops
- Spring ploughing
- Investments for improved water quality

### Extension and learning:

- Focus on Nutrients – Free consultancy for farmers on how to reduce their environmental impact.
- Assistance from catchment officers



## Example of available modules

Crop farm



### START

#### Start-up visit

- › Crop rotation and soil fertility
- › Nitrogen strategy
- › Climate check-up
- › Repeated nutrient balance
- › Phosphorus strategy
- › Plant protection
- › Soil compaction
- › Wetland construction

### FOLLOW-UP

#### Follow-up visit

Dairy or beef farm



### START

#### Start-up visit

- › Nutrients in feed
- › Ley production
- › Pasture use strategy
- › Climate check-up
- › Repeated nutrient balance
- › Stable construction
- › Plant protection
- › Phosphorus strategy
- › Soil compaction
- › Wetland construction

### FOLLOW-UP

#### Follow-up visit

Pig farm



### START

#### Start-up visit

- › Crop rotation and soil fertility
- › Crop rotation and soil fertility
- › Climate check-up
- › Repeated nutrient balance
- › Nitrogen strategy with manure
- › Stable construction
- › Plant protection
- › Phosphorus strategy
- › Soil compaction
- › Wetland construction

### FOLLOW-UP

#### Follow-up visit






greppa näringen



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## Example of available modules

Crop farm	Dairy or beef farm	Pig farm
		
<b>START</b> Start-up visit	<b>START</b> Start-up visit	<b>START</b> Start-up visit
<ul style="list-style-type: none"><li>› Crop rotation and soil fertility</li><li>› Nitrogen strategy</li><li>› Climate check-up</li><li>› Repeated nutrient balance</li><li>› Phosphorus strategy</li><li>› Plant protection</li><li>› Soil compaction</li><li>› Wetland construction</li></ul>	<ul style="list-style-type: none"><li>› Nutrients in feed</li><li>› Ley production</li><li>› Pasture use strategy</li><li>› Climate check-up</li><li>› Repeated nutrient balance</li><li>› Stable construction</li><li>› Plant protection</li><li>› Phosphorus strategy</li><li>› Soil compaction</li><li>› Wetland construction</li></ul>	<ul style="list-style-type: none"><li>› Crop rotation and soil fertility</li><li>› Crop rotation and soil fertility</li><li>› Climate check-up</li><li>› Repeated nutrient balance</li><li>› Nitrogen strategy with manure</li><li>› Stable construction</li><li>› Plant protection</li><li>› Phosphorus strategy</li><li>› Soil compaction</li><li>› Wetland construction</li></ul>
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# Focus on Nutrients



## Notable successes since 2001:

- 23 000 farm nutrient balances
- Reduced P surpluses on livestock farms by 30 – 90%
- Reduced N surpluses by 10%
- 8 800 consultancies on livestock feeding
- 5 500 consultancies on environment-adjusted fertilization
- 4 400 consultancies on wetland construction



# Implementation of the EU Water Framework Directive poses new challenges

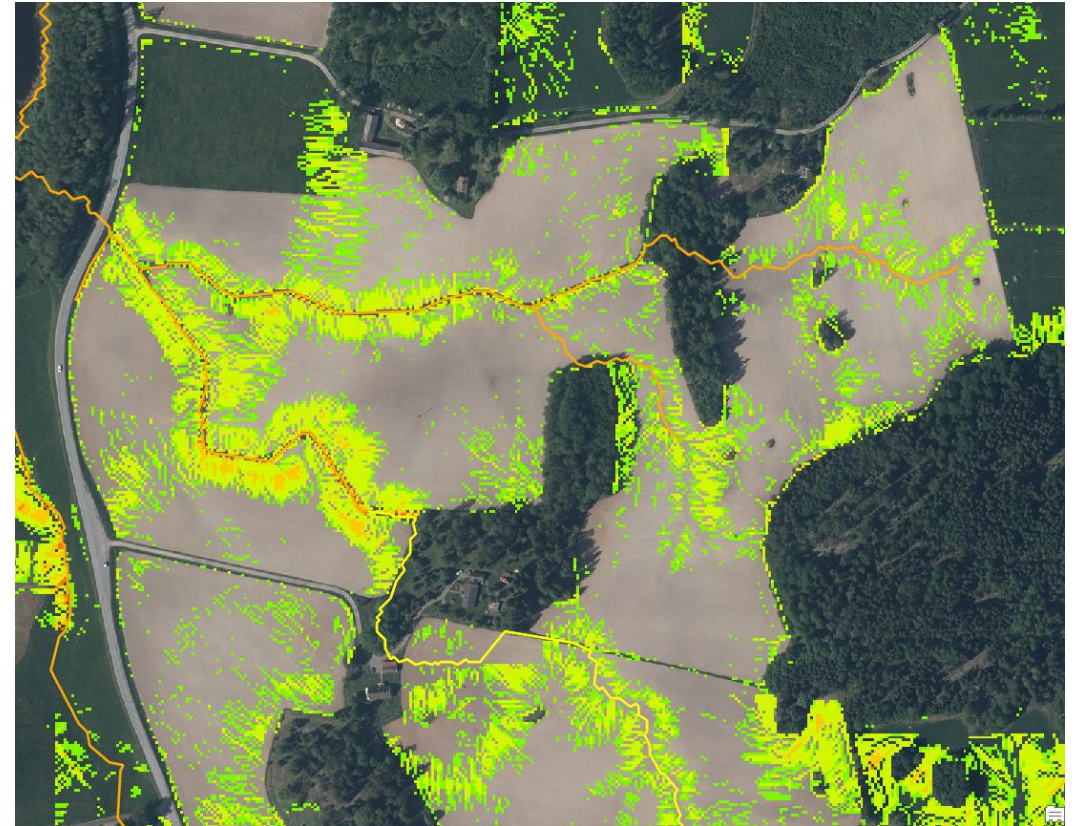
- About 2300 waterbodies are affected by eutrophication
- For more than 80% of these agriculture has been identified as a significant source of impact
- Focus has moved from nitrogen to phosphorus as well as nitrogen
- Extent of measures needed in agriculture exceeds budget for funding through EAFRD
- Modules in Focus on Nutrients are only partially linked to EQS and proposed "possible measures" in VISS
- How can a farmer know what measures (if any) need to be taken?



# Identifying possible measures – The theory

Measures are identified as those for which there is sufficient scientific evidence to quantify their effect, cost and potential extent:

- Buffer strips/zones
- Constructed wetlands
- Structural liming
- Catch crops (nitrogen only)
- Spring ploughing (nitrogen only)



Results are published per waterbody in VISS (Water Information System Sweden) as a list of “possible” measures.

For each measure the effect (kg P or N) and extent (e.g. total area of buffer zones) is shown.



▼ Möjliga åtgärder i Förvaltningscykel 3 (11 st)

Åtgärd	Åtgärdskategori	Åtgärdsplats	Effekter	Storlek	Tidsspann	T
<a href="#">Anpassad skyddszon - hög erosionsrisk vid WA70528702</a>	<a href="#">Anpassad skyddszon - hög erosionsrisk</a>	Blackstaån	Minskning Totalfosfor 95 kg/år	4,2 ha	2021 - 2027	
<a href="#">Anpassad skyddszon - medel erosionsrisk vid WA70528702</a>	<a href="#">Anpassad skyddszon - medel erosionsrisk</a>	Blackstaån	Minskning Totalfosfor 13 kg/år	2,7 ha	2027 - 2033	
<a href="#">Biotopåterställning Blackstaån</a>	<a href="#">Biotopvård i vattendrag</a>	Blackstaån			-	
<a href="#">Ekologiskt funktionell kantzon Blackstaån</a>	<a href="#">Ekologiskt funktionella kantzoner</a>	Blackstaån		37 ha	-	
<a href="#">Kalkfilterdiken vid WA70528702</a>	<a href="#">Kalkfilterdiken</a>	Blackstaån	Minskning Totalfosfor 100 kg/år	400 ha	2027 - 2033	
<a href="#">Skyddszon - hög erosionsrisk vid WA70528702</a>	<a href="#">Skyddszon - hög erosionsrisk</a>	Blackstaån	Minskning Totalfosfor 6 kg/år	2,6 ha	2021 - 2027	
<a href="#">Strukturkalkning - hög effekt vid WA70528702</a>	<a href="#">Strukturkalkning - hög effekt</a>	Blackstaån	Minskning Totalfosfor 420 kg/år	1 100 ha	2021 - 2027	
<a href="#">Strukturkalkning - låg effekt vid WA70528702</a>	<a href="#">Strukturkalkning - låg effekt</a>	Blackstaån	Minskning Totalfosfor 29 kg/år	320 ha	2027 - 2033	
<a href="#">Tvåstegsdiken vid WA70528702</a>	<a href="#">Tvåstegsdiken</a>	Blackstaån	Minskning Totalkväve 320 kg/år Minskning Totalfosfor 37 kg/år	3 400 m	2027 - 2033	
<a href="#">Våtmark för förbättrad vattenkvalitet vid WA70528702</a>	<a href="#">Våtmark för förbättrad vattenkvalitet</a>	Blackstaån	Minskning Totalkväve 2 500 kg/år Minskning Totalfosfor 290 kg/år	7,9 ha	2021 - 2027	

# Identifying possible measures – The practice

5.4 ha buffer zones where?

Measure	Effect	Extent
Buffer zone along waterways	95 kg P yr-1	5.4 ha
Structural liming, high effect	420 kg P yr-1	1 100 ha
Structural liming, low effect	29 kg P yr-1	320 ha
Constructed wetlands	290 kg P yr-1	7.9 ha

I have applied structural lime to 50% of my land. Is that enough?

I know a possible place for a wetland on my land. Would that do?



# LIFE Rich Waters Action C6: A method for establishing water plans for agriculture



## Farm-level water plan



EAFRD &  
LOVA  
funding

Other  
funding

In consultation with farmer identify sources of emission

Verification in field

With farmer identify suitable measures

## Catchment-level water plan for agriculture

Initiated by catchment officer in consultation with farmers

Verification of "possible measures" in VISS

With farmers identify suitable measures and coordinate process of implementation

The right measure in the right place and to the extent required to meet the EQS

