


MORSA  PROSJEKTET

The Morsa River Basin, Norway – Collective action for improving water quality !







Seminar on WFD Principles and its links with habitat
directive, Sarajevo 12-13.04.07
Helga Gunnarsdóttir, leader of management Morsa

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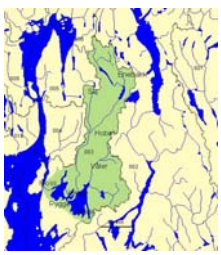
Morsa watershed characteristics



- Watershed area: 690 km²
- Land use: 80% forest, 16% agriculture (mainly grain crops), 4% lake surface
- Inhabitants: 40 000 (mainly in small towns, more than 2000 households with little or no treatment of waste water)
- Management: 8 municipalities, 2 counties



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Morsa watershed characteristics



- **Natural conditions**
 Geological: Marine clay deposits
 Geographical: The lake is located downstream
- The lake Vansjø (source of drinking water for 60 000 people) receives pollution from human activity in the whole watershed
- Low recipient capacity – no clean water from mountains etc
- The Morsa river basin needs more comprehensive actions to stop man made pollutions than other Norwegian watercourses

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The nexus of Cause and Effect

- Many years (50) with too heavy loads of nutrients due to:
 - Increased population, WC, scattered dwellings with little or poor cleaning of wastewater
 - Intensified and more effective agriculture
 - Climatic changes; mild winters, warmer summers
 - Reduced national focus
 - Little cooperation, mutual trust and understanding
- Main problems:
 - Too heavy loads of P (phosphorus) -> Highly eutrophic - toxic bluegreen phytoplankton blooms
- User conflicts:
 - Agricultural and waste-water run-off against
 - Drinking water (Lake Vansjø), outdoor life (mainly bathing), biodiversity, fishing and irrigation

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The prehistory of Morsa

- 1964 Increasing phosphorus (P) levels in Lake Vansjø (NIVA)
- 1970-> Increasing P and algae (blue-green) contents
- 1979-85 Cooperation to reduce the P-loads, mainly waste water (sewage from towns)
- 1988 Algae blooms in the North Sea and Skagerak
- 1988-> Increasing focus on agricultural run-off
- 1990-> No signs of better water quality in Lake Vansjø despite reduced P-loads
- 1994 Environmental advisors in the 4 Vansjø municipalities start working with the Vansjø-plan
- 1997 The Vansjø-plan adopted by the local authorities surrounding Vansjø
 - "We must cooperate with the 4 up-streams local authorities"
 - Pre-Morsa organizing committee
- 1999 The Morsa-project starts
- 2005 A permanent WFD watershed organization Morsa is established

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What did I observe in 1999?

Little mutual trust and understanding

Splits between:

- environmental and agricultural authorities
- upstream - downstream authorities
- farming community and public authorities

Different management cultures and lack of cooperation

- municipalities, counties and sectors

Those in charge were "unable" to take action

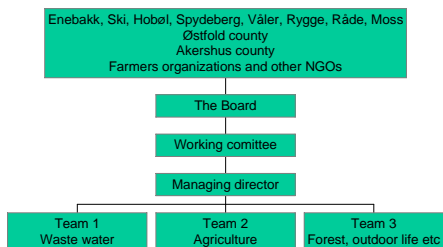
What did I observe ...


- A lot off:
 - "Not on my thurf", "old rubbish" and conflicts
 - Top-down management
 - "Heaping blame"
 - Disclaim of responsibility

Help! – How to change attitude?

- To create:
 - Process
 - ↓
 - Cooperation, trust and common understanding
 - ↓
 - Collective action in the whole watershed and more integrated water management
- Tools:
 - Organization and new water management guidelines


The Morsa River Basin organization



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Morsas management strategies

- Management based on knowledge → public understanding and consensus
- Objective and neutral analysis – Environmental institutes 2001
 - Status, objectives, measures and costs
- Plans in every municipality 2002
- Environmental program for the agriculture 2002
- Action plan for Morsa- adopted by local authorities **2003**

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Abatement measures analysis for Morsa Summary

Jordforsk and NIVA

Water quality: Eutrophication – blue green algae


P-load: 19,5 tons (11,1 agriculture – 3,3 waste-water - 5,1 background)



Water quality objectives: Suitable for user interests (drinking water, bathing, fishing and irrigation) = Good ecological status as defined by EU water framework ..

Necessary removal of P? 65% = 9.4 t; 7.1 agriculture - 2.3 waste- water

Abatement measures: Red. tilling, vegetative buffer zones (filter strips), constructed wetlands, sewage treatment

Costs: > 350 mill. NOK or 43 mill. EURO (37 mill Euro for sewage treatment, > 6 mill. Euro in Agriculture)

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Objectives

- Water quality objectives
 - Rivers and lakes should be suitable for bathing, fishing, irrigation and producing drinking water (Storefjorden)
 - Good ecological status within 2015 (EUs WFD)
 - Better water quality in two steps:
 - 2010
 - 2015
- Measure objectives
 - 65% off man made P-loads (9,5 tons) must be removed.
 - 2.3 tons P from waste water and 7.2 tons P from agricultural runoff
 - Outcomes in two steps:
 - 2002-05 6,5 t P
 - 2006-08 3,0 t P

The most important abatement measures

→ No tilling in fields with high run-off:	4.000 kg P
→ Waste water treatment (single household):	1.800 kg P
→ Waste water treatment (local communities):	550 kg P
→ Constructed wetlands:	1.500 kg P
→ Grass cover zones:	200 kg P
→ Vegetation zones:	> 200 kg P
→ Other measures:	1.250 kg P
Total	> 9.500 kg P

Agriculture Challenges in 1999

Cause

- Political pressure on more intensive and effective
 - Artificial land levelling
 - closing of creeks
 - straighten out of rivers
 - draining of wetlands
 - removing of buffer zones
 - over-specialization
 - increased harvest and use of fertiliser

Greater focus on:

- Flooded areas and fields with high erosion risk
- Construction of new wetlands, buffer zones and vegetation zones
- Better and more integrated regulations and support measures



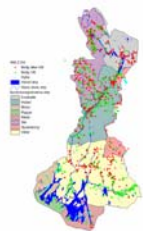
Status Agriculture

Environmental measures	1999	2005
Tilling practise	No autumn tilling (20-30%)	No autumn tilling (ca 60%)
Constructed wetlands	4	40
Veg. Buffer zones	0	>200 km
Tree- and shrub planting	0	15 km, 8000 plants
Grass filter strips	< 1 km	5 km
Environment plans on farms	0	"All"
P-load from agriculture	11 tons	6,5 tons?*

*Reduced 4,5 tons or 400 truckloads with soil per year?

Waste water treatment some results

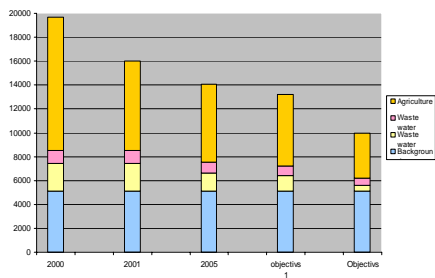
- Before 1999 300 mill NOK
- 1999-2005 200 mill NOK
- In 1999 2000 household with little w w treatment
- In 2006 900 household remain, fulfilled in 2008?
- Objectives to remove 2.3 t P
- Status 2006 approx. 1.1 t P

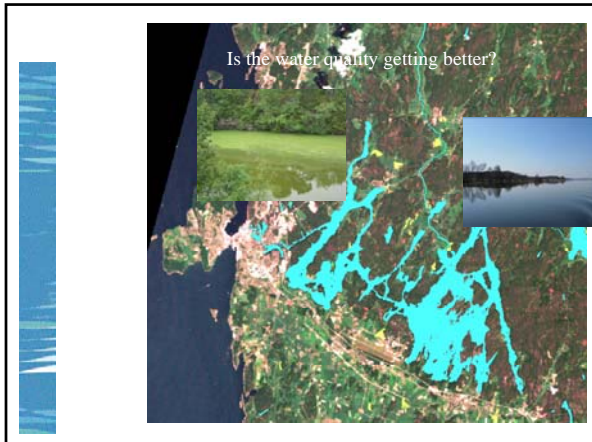


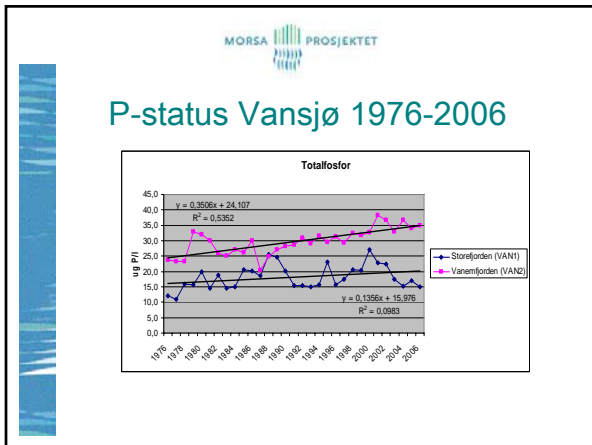
Status for P-reduction and final goal

Abatement measure	2006	Potential
Waste w single househ	1.100	1.800
Waste water towns	200?	550
No tilling in autumn	3.600	4.000
Wetlands & buffer zones	950	1.700
Grass filter stripes	?	200
Other measures	?	1.250
Total	> 5.800	9.500

P-loads







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Why has a scientific analysis lead to measures costing 250 mill NOK in 5 years?

- Objective and neutral analysis is essential for public understanding and consensus
- Scientific documentation is important to:
 - get rid of discussion on "who to blame"
 - assist local authorities when making instructions leading to expensive measures
- Common knowledge is a critical factor for obtaining collective action
NIBR 2005

Outcome and main reasons for success

NIBR 2005/6

- Integrated management – cross-cooperation
- Local involvement – the municipalities are "holding the key"
- Organizing:
 - Supportive board of "all" stakeholders headed by one of the Mayors
 - Working groups cross-county/municipal
- Common knowledge – Objective Abatement measure analysis
- Mutual trust
- Harmonizing of regulations and financial support

Lessons learned on public participation PP

The PP-processes should be deeply rooted in local politics.

PP is fundamental to handle pollution from many diffuse sources.

Participation and responsibility should be rewarded the reverse action should be "penalised".

Decisions and actions have to be based on scientific knowledge.

PP requires time and resources!



The Key to Political and Public involvement - Networks and collective action ?

- *The study shows that the Morsa-project, and its subsidiary networks, has led to increased contact and trust among the different actors in the river basin. This, together with establishment of shared knowledge, seems to be an important precondition for collective action in form of farming-related measures and drainage mechanisms from dispersed discharge points.*

Knut Bjørn Stokke Norwegian Institute for Urban and Regional Research (2004)