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Enhancing Society Together

On track in harmonizing agriculture and vulnerable DW abstractions

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Context of the project

- WFD – Drinking water protection files – Program of measures
- No political support for tightening of provincial regulations regarding nutrients
- No political support for financially based measures
- Measures are based on voluntariness – and a Mutual Gain Approach

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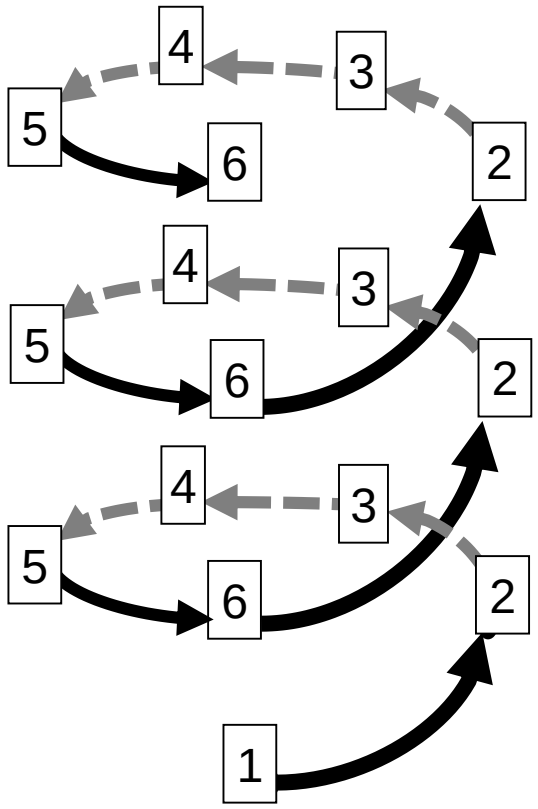
Approach - in short

- Problem: nitrate concentrations exceeding standards in GWPA
- Objective (WFD): nitrate concentration groundwater max 50 mg per liter and purification effort required for drinking water production has to decrease
- However: farmer needs a clear objective related to his agricultural management
- Gain of province & water company: soil N-surplus of max 100 kg per ha
- Gain of farmers: increasing operational result by optimizing nutrient cycles, anticipating on future policy developments

Improving the farming system

6. Evaluate
5. Analysis of results
4. Monitoring
3. Testing
2. Identification of measures & implementation in farm system
1. Environmental standards as boundary condition



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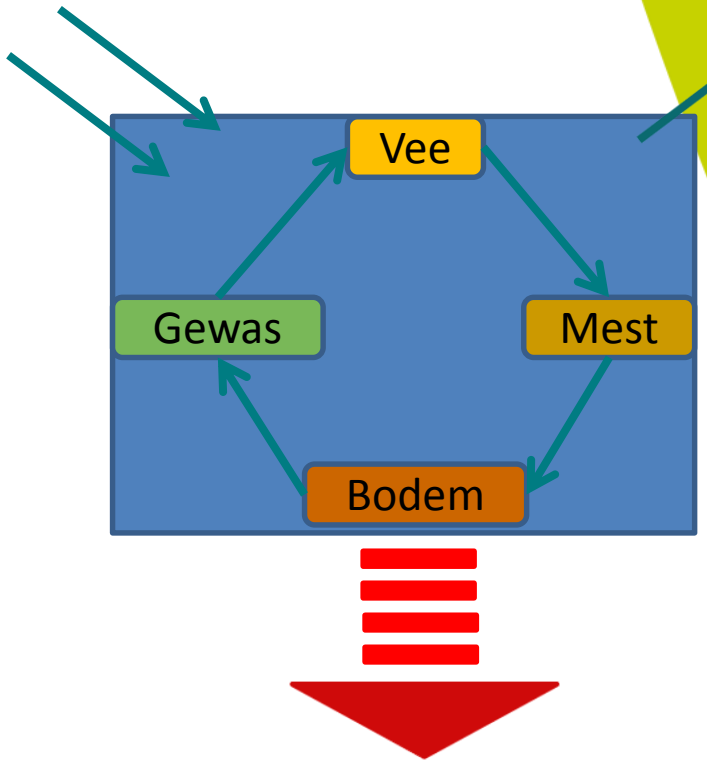
Annual Nutrient Cycle Assessment as tool for farm system analysis ...

- Nutrient cycle
  - From fodder to cattle
  - From cattle to milk and manure
  - From manure to soil
  - From soil to crops

  - Reduction of losses benefits all, but the ANCA produces figures, not measures



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Identification of measures

	Toepassing		Plan	Opmerking		
Maatregelen	Tot 2013	2014	2015	Al praktijk	Nieuwe maatregel	Voorstel (niet eerder besproken)
- Overzicht vergroten op het bedrijf				Met nieuwe stal en goede logistiek is dit voor elkaar		
- Minder jongvee				Nvt vanwege groei bedrijf		
- Scherper voeren				Minder aandacht voor geweest door verbouwing ed.		
- Ammoniak emissie arme stal				in orde (emissie arme vloer)		
- Ammoniak emissie arm aanwenden				is al veel aandacht voor		
- Minder intensief beweiden				Beweid redelijk intensief (23% van de mest is weidemest)		
- Minder najaarsbeweiding	?	?		Mogelijk een einddatum stellen?		
- Omweiden (optimaal beweidingssysteem)				Beweidingsaanpak ontwikkelt zich afhankelijk van weer		
- Wiedeggen in gras				Dit wordt al uitgevoerd		
- Doorzaai voor een betere graszode				Streven om botanische samenstelling gras te verbeteren		
- Gras/maïs vruchtwisseling						
- Onderzaai/Proterra				Beschikbaarheid loonwerker noodzakelijk		
- Vroege maïs en tijdige nazaai				Nvt als ondergezaaid wordt		
- Mestonderzoek op samenstelling				Toepassen ter ondersteuning bemestingsplan		
- Mestopslag vergroten				Is door nieuwbouw in 2014 voldoende		
- Perceelsgericht bemesten				Hier is interesse voor, ondersteuning uit project nodig		
- Minder bemesten wendakkers/bij bomen						
- Drijfmestrijenbemesting in maïs				Beschikbaarheid loonwerker noodzakelijk		
- Wiedeggen in de maïs				Is praktijk op dit bedrijf		
- Maatwerk bij tijdstip bespuiting in maïs	?	?	?	Niet specifiek besproken		
- Vlakleggen percelen	?	?	?	Niet specifiek besproken		
- Lage dosering bespuiting	?	?	?	Niet specifiek besproken		
- Bodemstructuur verbeteren				Door bemesten met schelpenkalk, ook pH		
- Bodemverdichting opheffen	?	?	?	Niet specifiek besproken		
- Organische stof verhogen				Is altijd aandachtspunt, zeker gezien vruchtwisseling		
- Milieumaatregelen in aardappels				Nvt		
- Milieumaatregelen in lelies				Nvt		

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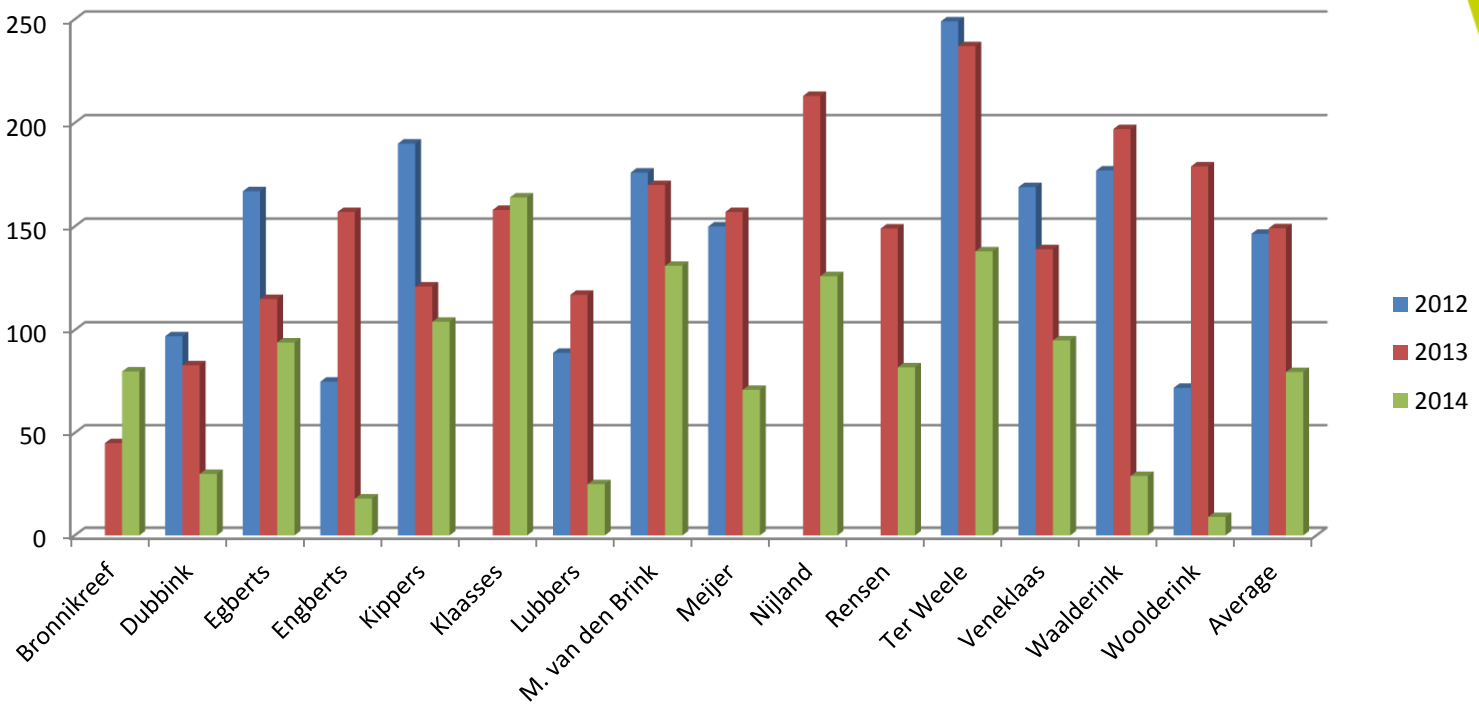
Possible measures ...

- Measures based on ANCA (specific for each farm) and shown during field demo’s
- Grass in mais as winter cover crop: uptake of redundant nutrients by grass increasing the soil organic matter and structure at the same time
- Application of manure exactly with the mais: same yield with less manure, saving manure for grass

Results soil N-surplus



Soil N-surplus (kg N/ha)

- 2012: 165
- 2013: 159
- 2014: 83
- 11 farms <= 100; 4 farms > 100

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Economics of measures

- Starting points
  - Data per farm from ANCA
  - Rules of thumb
  - Data and rules were discussed with the farmers

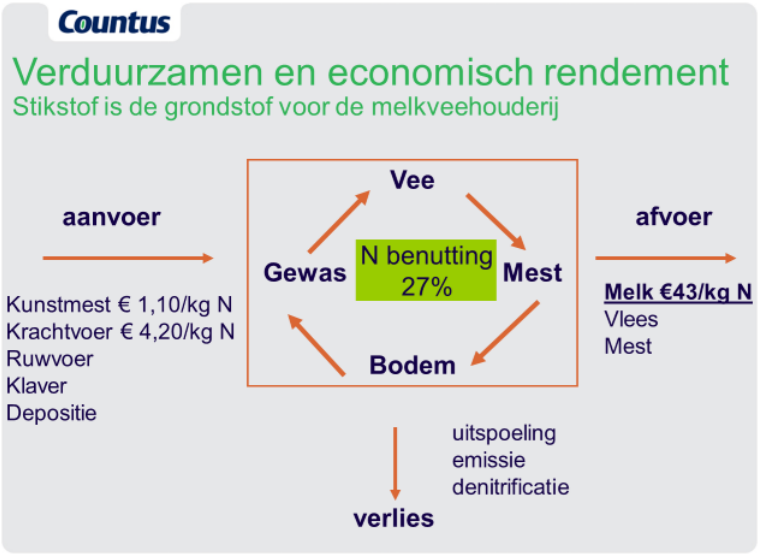

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Illustration

- Grass in mais as winter cover crop
  - Value of organic matter production is appr. 1000 kg ds
  - = € 100 / ha
  - Extra costs contractor € 30 / ha
  - Net profit € 70 / ha

- Manure application exactly to mais
  - Saves 15 m3 manure / ha
  - 15 m3 á 4 kg N > produces 20/25 kg ds / kg N elswhere on the farm (grassland)
  - Extra costs € 100 / ha
  - Net profit € 25 / ha

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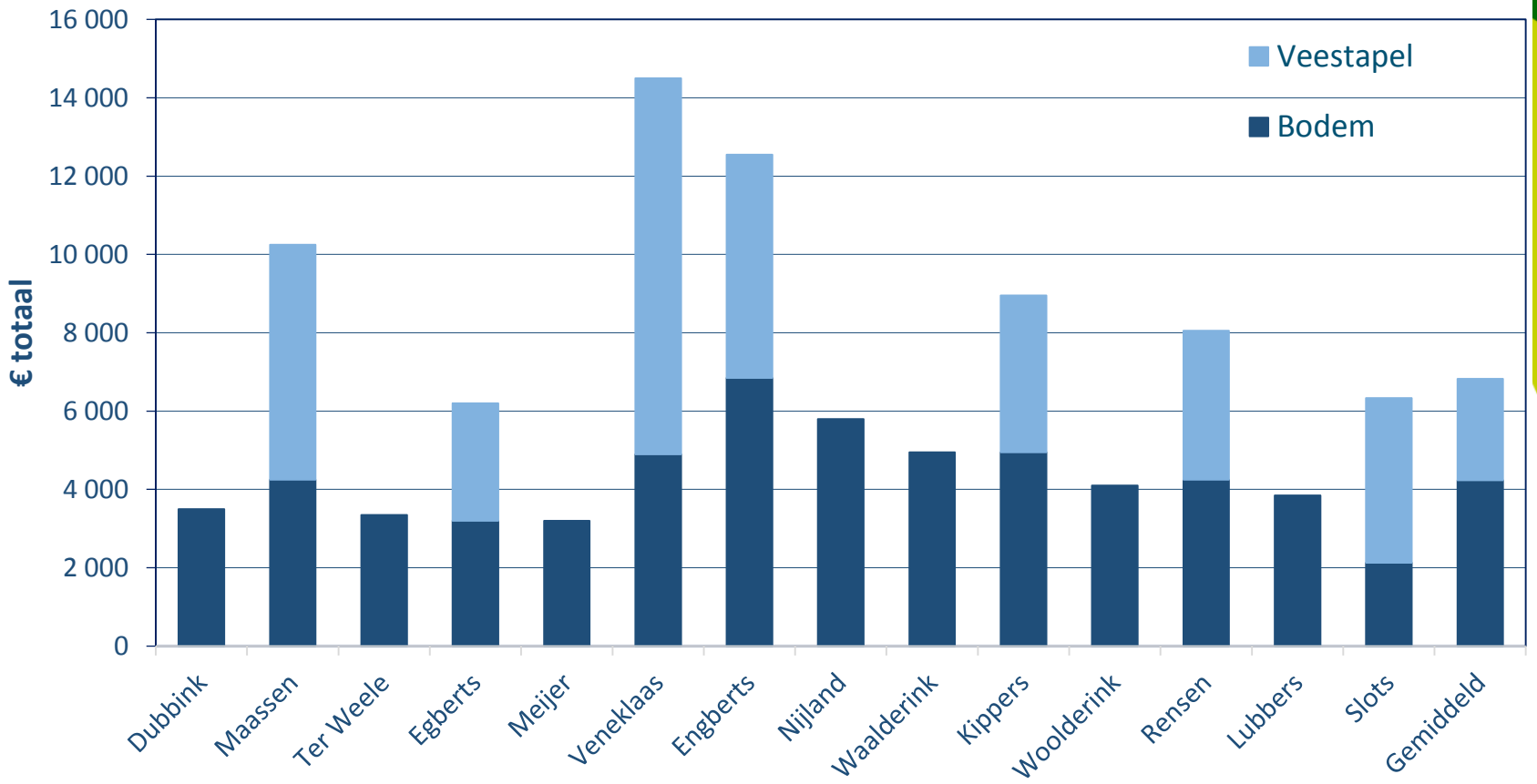
Additional measures

- Examples of net profit of measures per farm:
  - Application of manure related to crop uptake: € 2.700,-
  - Less manure application at short side of the parcel: € 1.000,-
  - Grass in mais as winter cover crop € 720,-
  - Manure application exactly to mais € 260,-
  - Less young cattle € 2.280,-
  - Stricter diet of cattle € 4.980,-

Economic results per farm



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Monitoring of groundwater quality

- Objectives
- Establishment of starting situation
- Monitoring of nitrate concentration directly related to the management of participating farms
- Sampling procedure identical with the Minerals Policy Monitoring Programme (LMM)

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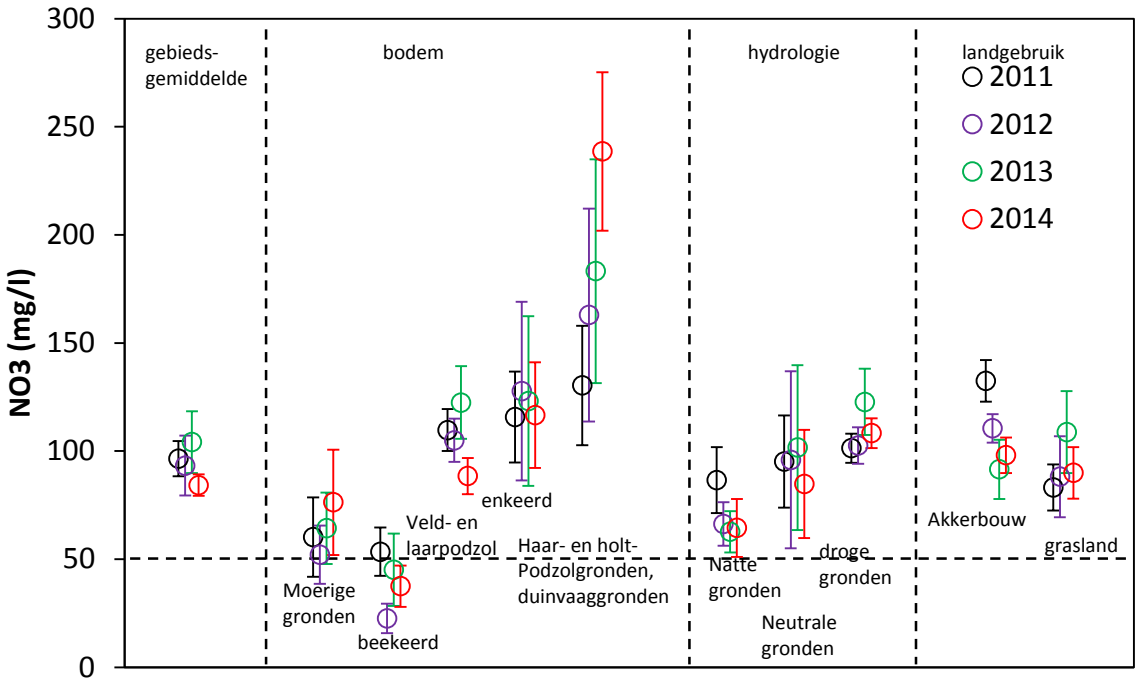
Monitoring strategy

- Stratified monitoring design based on the strata:
  - Soil type
  - Land use (grass, arable crops; nature)
  - Groundwater table
  - Participant
- Density appr. 170/200 ha agriculture and 50/1800 ha nature
- Estimation of nitrate concentrations in GWPA based on S, L en Gt

Results groundwater quality



- 2011 - 2014: 96, 93, 104 and 84 mg NO3/l in agricultural area (grass, maize & other arable crops)
- 2014: 31 mg NO3/l in nature (deciduous forest, coniferous forest, moors)

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Conclusions

- Looking back:
  - The soil N-surplus is reduced to 100 kgN/ha on average
  - The nitrate trend in groundwater points downwards
  - The approach shows excellent preliminary results at most participating farms
  - Participants like the project and are willing to continue - in their local interest

Conclusions

- Looking forward:
  - The farming systems are not yet stable (at a soil N-surplus of 100 kgN/ha): farmers need to be more autonomous in identifying & implementing measures from ANCA data
  - Trends are not yet statistically significant and nitrate levels are still exceeding the standards
  - The degree of participation (max 30% in GWPA) is too low to realize WFD-objectives within the entire GWPA, so more farmers will have to be invited to participate in the project which opens the opportunity for the current participants to widen their role towards ambassadors – from a regional interest

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Thank you for your attention

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