Evaluation of Manure & Fertiliser Act 2016

- On request of Ministries of Economic Affairs and of Infrastructure & Environment
- Legal obligation for accountability towards the Dutch parliament
- Review the degree of reaching targets, its effectivity and efficiency
  - Focus on period 2006-2015
  - Forward look (2027) in view of targets of Water Framework Directive

- Sources
  - Underpinning research by Wageningen University & Research, RIVM, Deltares, CBS

30 May 2017
Evaluation of Manure & Fertiliser Act 2016
Synthesis report – Background documents

30 May 2017
Evaluation of Manure & Fertiliser Act 2016
Synthesis report – PBL contributors

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Dutch Manure & Fertiliser Act targeting improvement of water quality

Intervention points in the Dutch Manure and Fertilisers Act in relation to agricultural activities and water quality

National approach:
- EU Nitrate Directive
- EU Water Framework Directive

Protecting quality of soil, groundwater and surface water

Source: PBL
Solving the Dutch manure problem is a balancing act between environmental and economic values

- Agricultural production is economically and ecologically very efficient per unit of product,
- but because of its volume, environmental pressure remains high
Decreasing $\text{P}_2\text{O}_5$ legal application space, increasing production

- national ceiling for manure production at 2002 level (173 million kg $\text{P}_2\text{O}_5$)
- condition for nitrogen derogation

Source: CBS Statline
Balanced fertilisation for phosphate reached in 2014

Nitrogen and phosphate surpluses on the agricultural soil balance

Nitrogen

Phosphorus

Phosphate balance: Supply = removal

Source: CBS Statline
Nitrate concentration decreases, but decrease levels off

Nitrate concentrations in upper groundwater, in sand region

Source: RIVM
Nitrate decrease caused by delayed effect of MINAS system

Manure fraud
‘Exceedance of legal application standards’ may cause 5 to 30 mg per liter additional nitrate leaching

Increased application of manure separation
Reduces potential decrease of nitrate by stricter N application standards in 5th Nitrate Action Programme
No significant decrease phosphorus concentration in surface water

Phosphate concentrations, specifically in agricultural surface waters

- **Sand region**
  - mg P per litre
  - Measurements from 2000 to 2016

- **Clay region**
  - mg P per litre
  - Measurements from 2000 to 2016

- **Peat region**
  - mg P per litre
  - Measurements from 2000 to 2016

Nitrogen concentrations do decrease significantly

Source: Deltares; adaptation by PBL

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Phosphate policies were effective, but limited improvement water quality expected in 2027

**Causes of change in phosphorus loading of surface water, 1985 – 2027**

- **1985**: Phase o No additional policy
- **Phase I**: Application standards phosphate in manure
- **Phase II**: Nitrogen and phosphate loss standards, under the MINAS system
- **Phase III**: Nitrogen and phosphate application standards
- **Phase IV**: Phosphate differentiation application standards
- **2027**:

Source: STONE model of Wageningen Environmental Research; adaptation by PBL
Pollution regional waters, agricultural soils largest source but only partly controllable

Nitrogen and phosphorus loading of surface water, per source, 2010 – 2013

Source: Wageningen Environmental Research; adaptation by PBL
WFD-task surpasses maximum reduction potential and scope of Good Agri. Practice

Nitrogen and phosphorus loading of surface water, per source, 2010 – 2013

Nitrogen

Phosphorus

Source: Wageningen Environmental Research; adaptation by PBL

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Main conclusions

- Current manure and fertilizer policy stabilizes environmental problems and pressure on manure market, but doesn’t solve the whole problem
- Nitrate target not within reach for upper groundwater in southern sand region
- Manure separation and manure fraud may be causes
- WFD targets for nutrients in regional surface waters cannot be combined with current agriculture in large parts of southern sand, central clay/peat region
- Regional arrangements in addition to generic manure policy may be part of the solution
Thank you for your attention

30 May 2017