Environmental Impact Assessment (EIA) of Effluents from Constructed Wetlands on Water Quality of Receiving Watercourses

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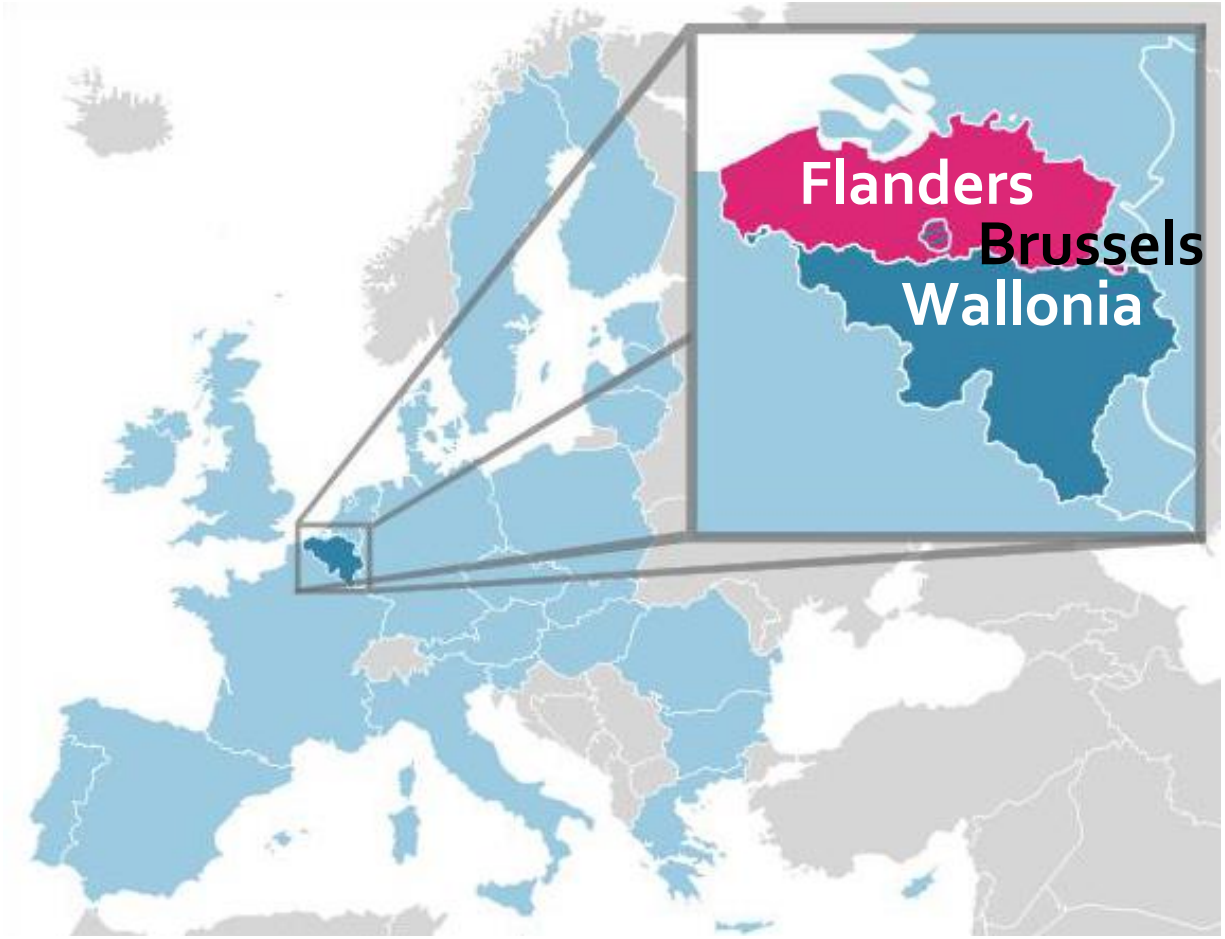
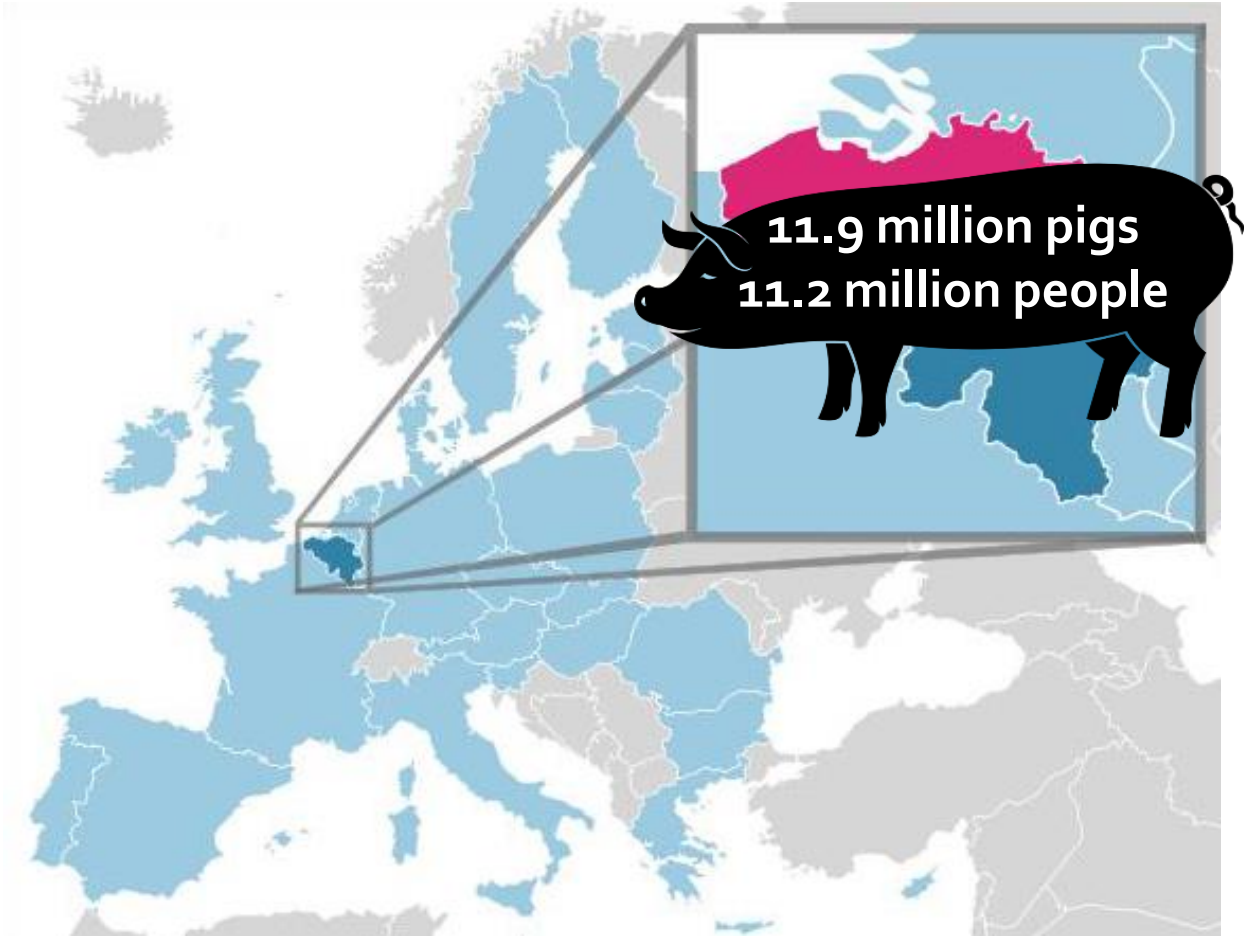
Promoters
Prof. P. Goethals
Prof. E. Meers

BELGIUM



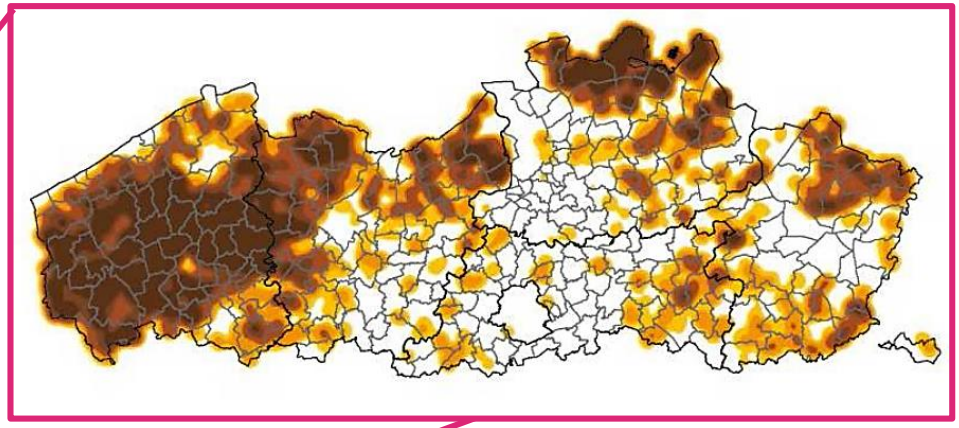
BELGIUM

3rd highest pig breeding country across Europe

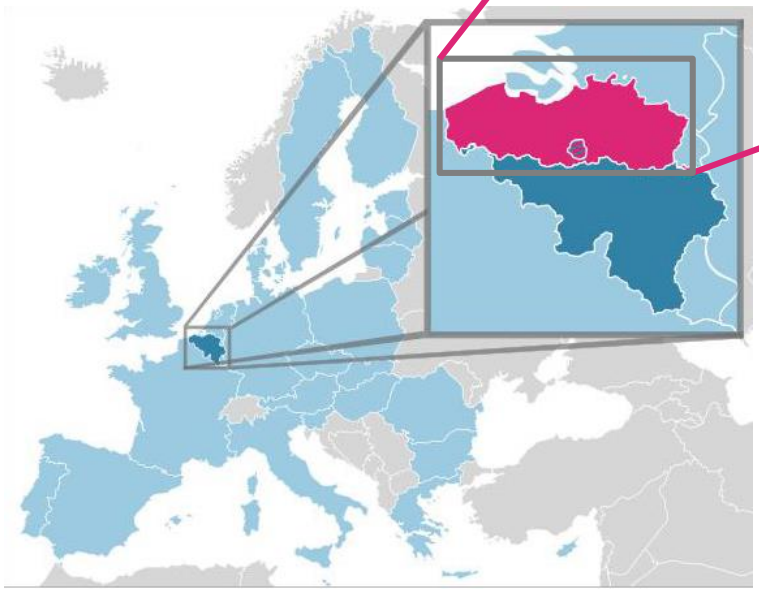


PIG PRODUCTION AND MARKETING VALUE

- <200
- 200 – 500
- 500 – 1000
- 1000 – 2000
- 2000 – 3000
- > 3000 (max 14.253)

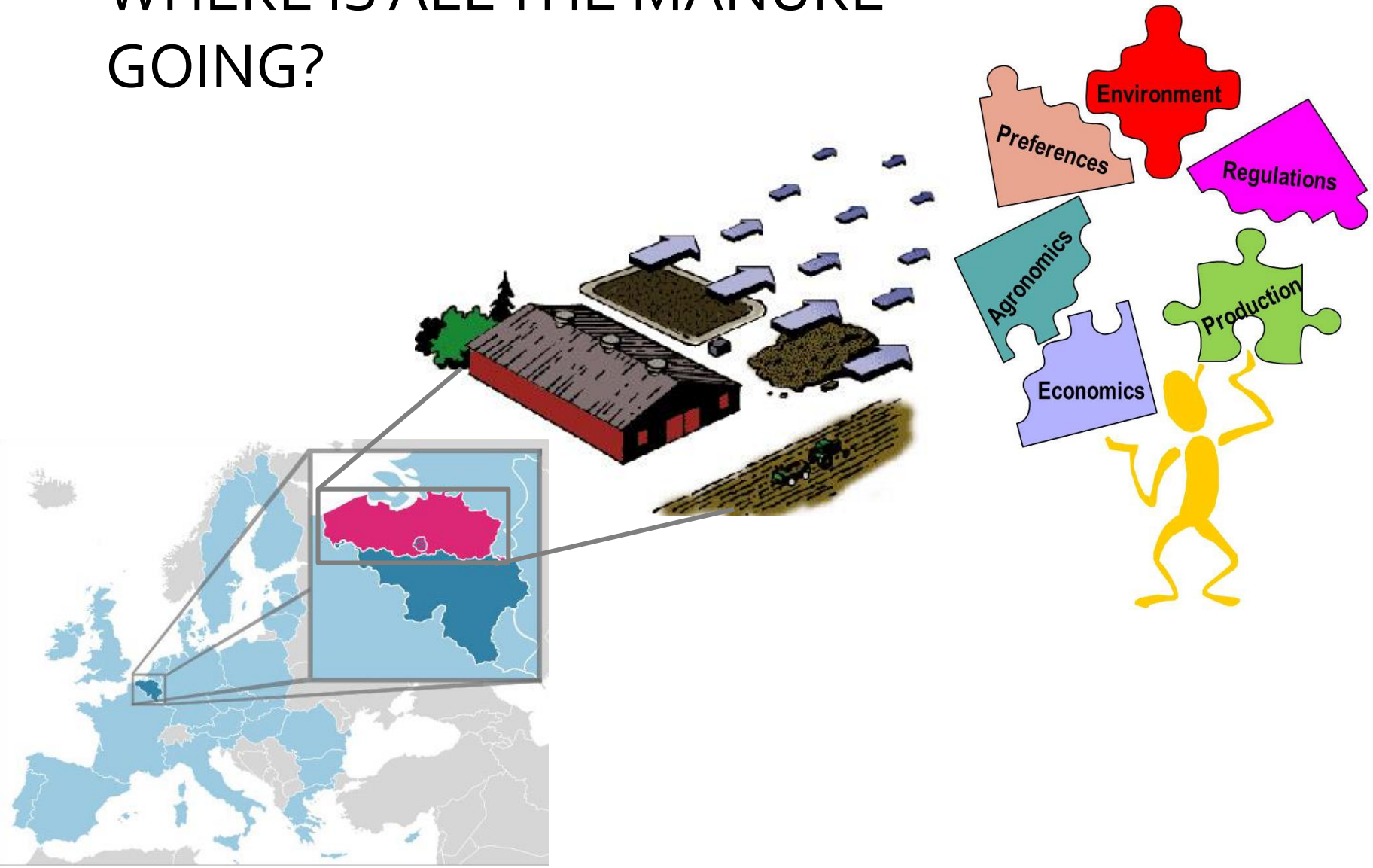


(Lara 2012)

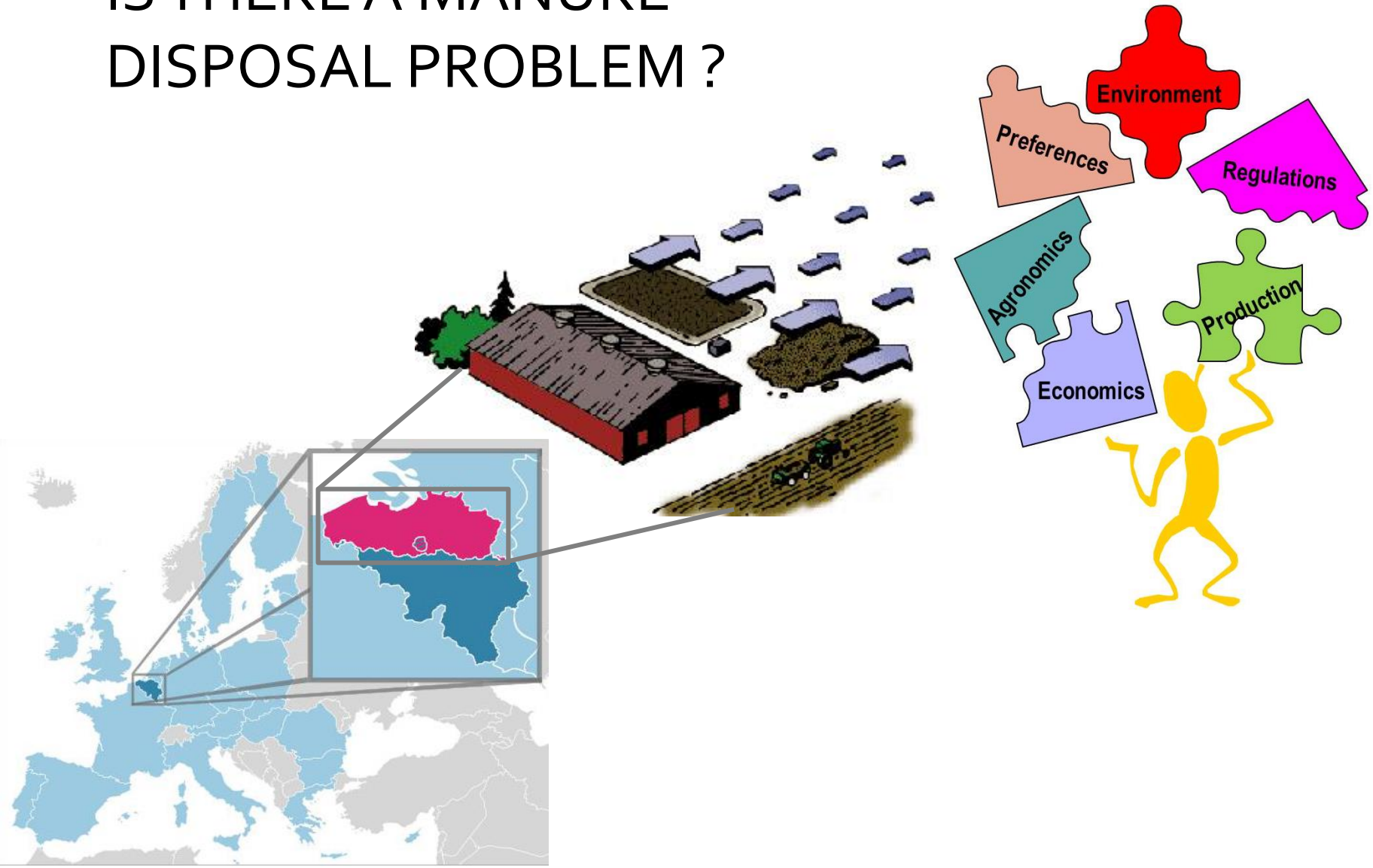


Pig production **in euro per hectare** in 2010

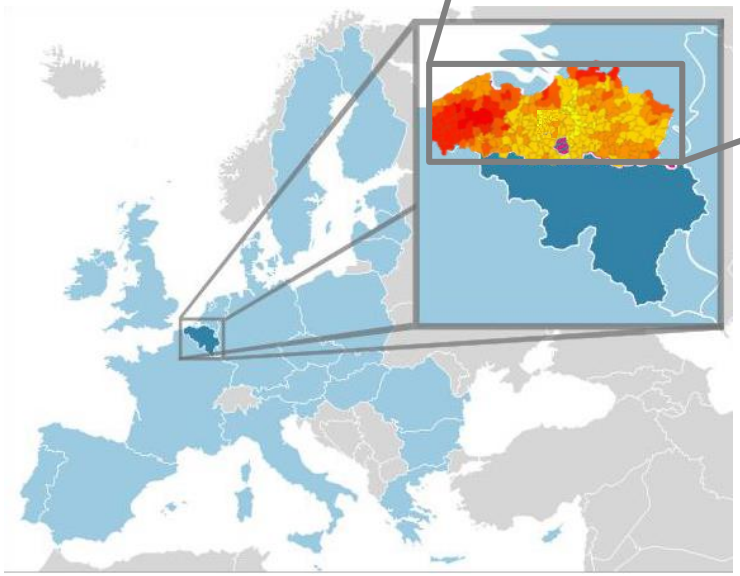
WHERE IS ALL THE MANURE GOING?



IS THERE A MANURE DISPOSAL PROBLEM ?



YES!



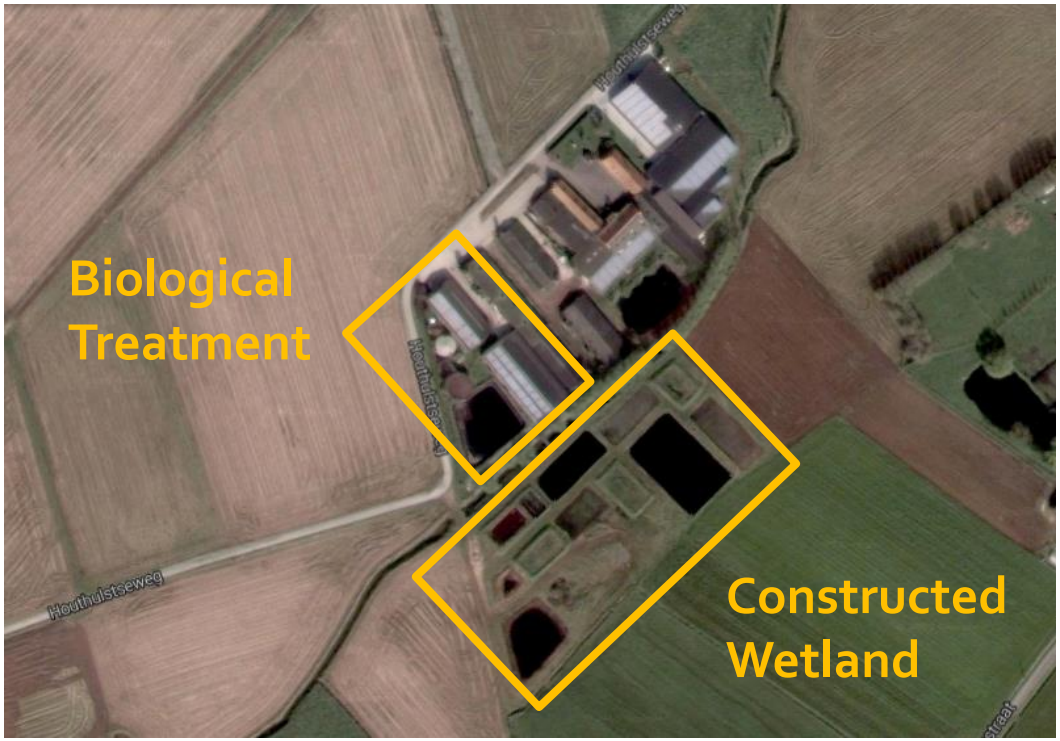
- < 50 mgNO_3^-/l
- > 50 mgNO_3^-/l

MANURE MANAGEMENT

- Solid
- Liquid
  - Liquid fraction manure treatment system
    - **Constructed Wetlands**

IMPACT ASSESSMENT OF EFFLUENTS FROM CONSTRUCTED WETLANDS

Case study

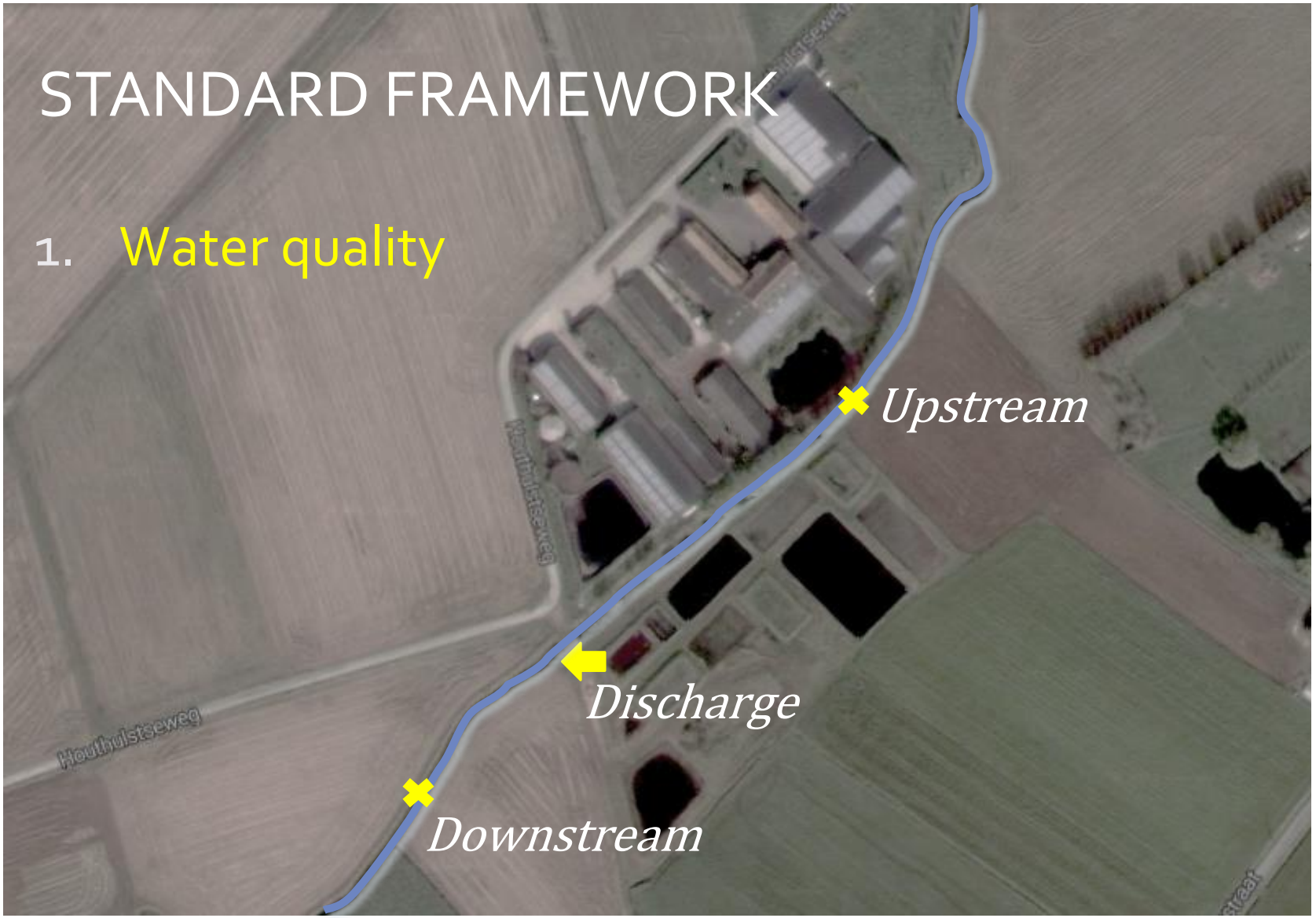


Studied Variables

TN
TP
Cl^-
SO_4^{2-}

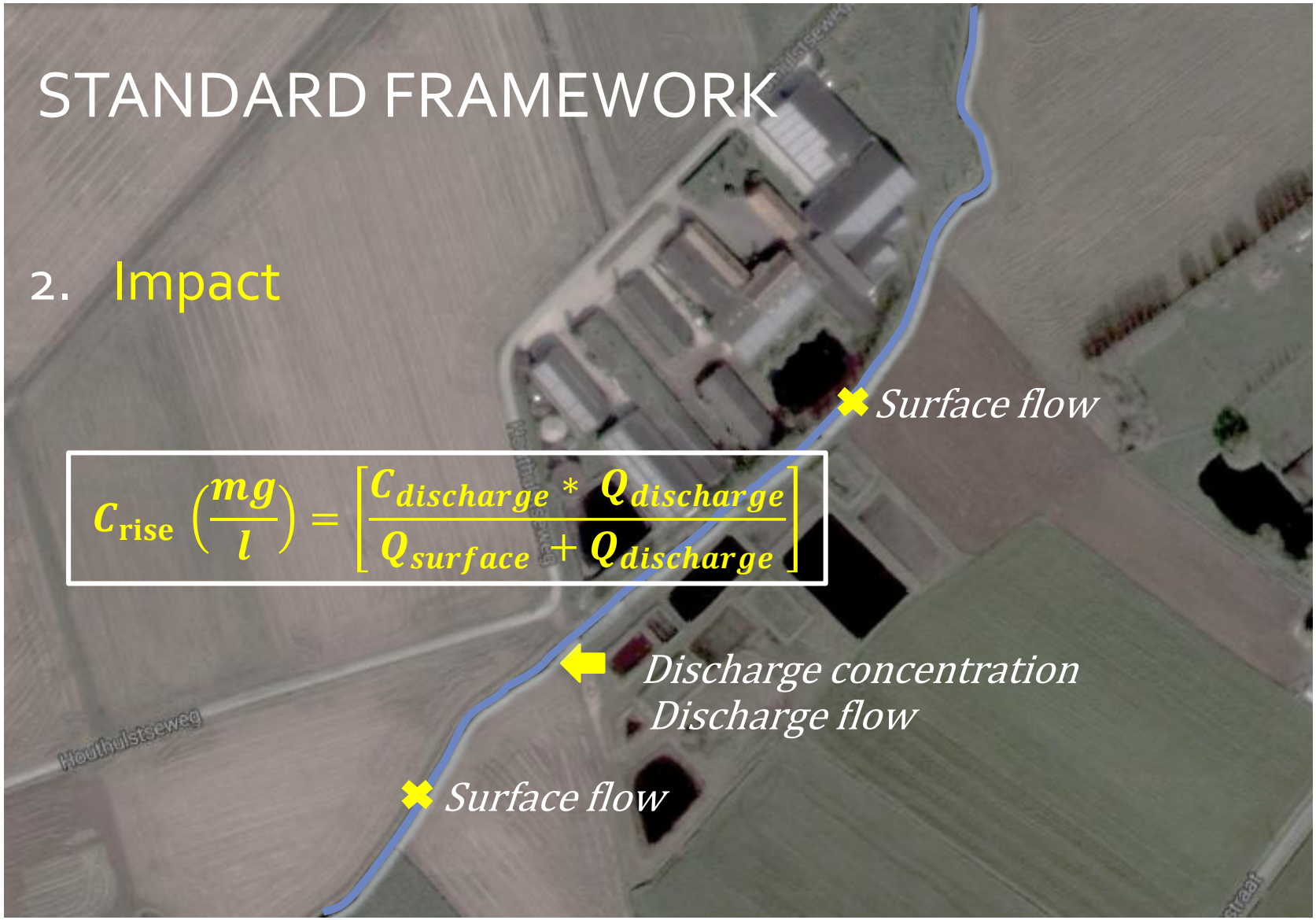
STANDARD FRAMEWORK

1. Water quality



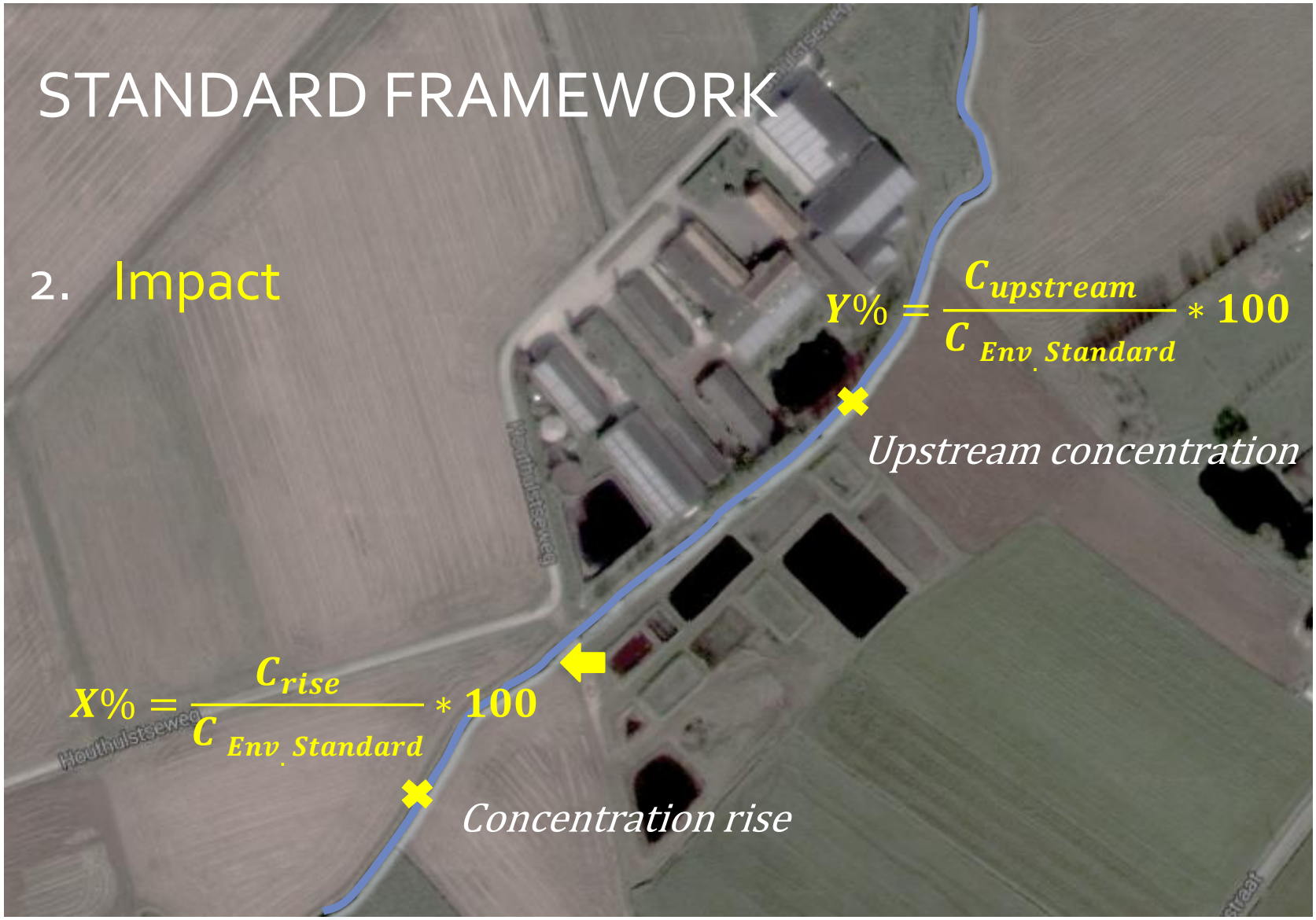
STANDARD FRAMEWORK

2. Impact



STANDARD FRAMEWORK

2. Impact

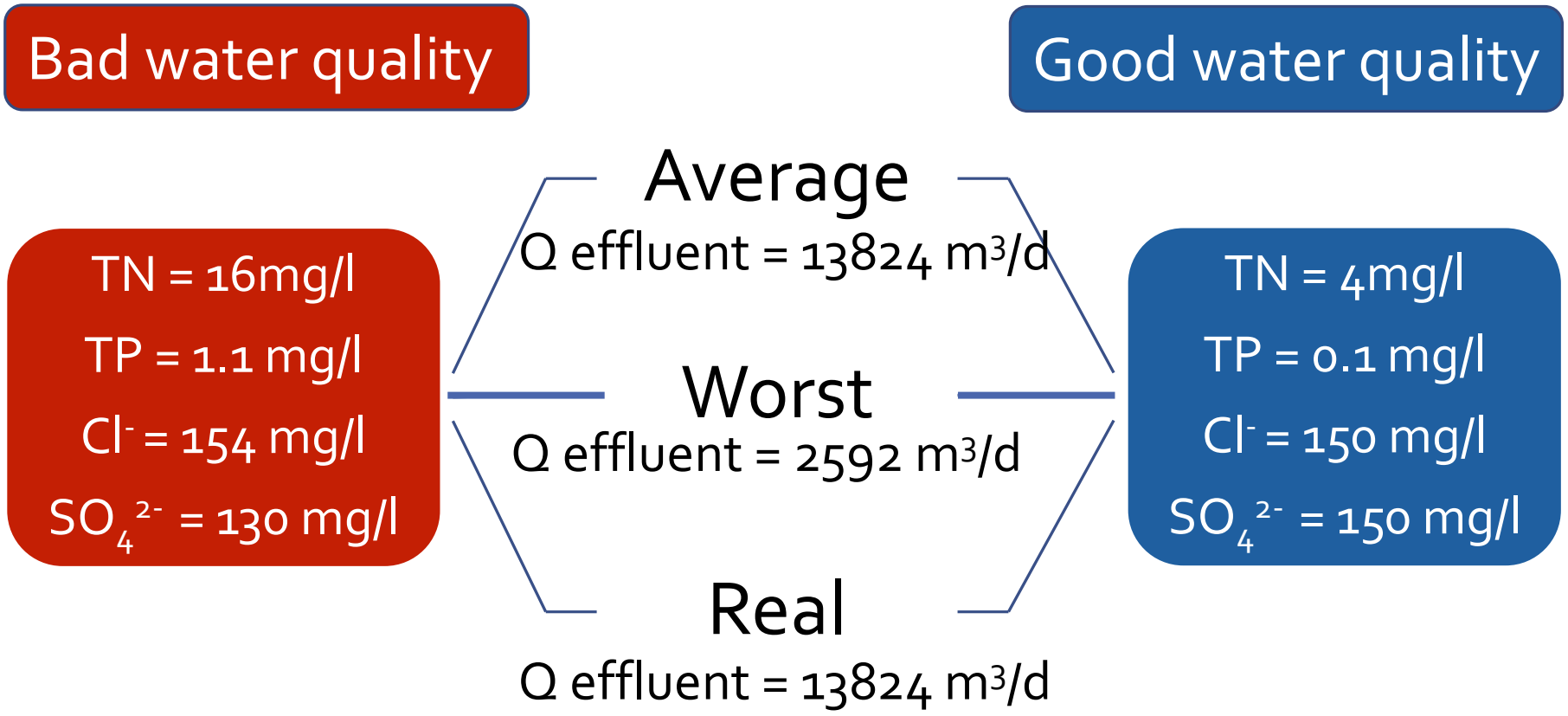


IMPACT CONTRIBUTION

- Significant
- Relevant
- Limited
- No contribution

$C_{upstream}$ vs. $C_{standard}$ / C_{rise} vs. $C_{standard}$	1 % < X < 10%	10 % < X < 20%	X > 20%
Y < 50%			
50% < Y < 75%			
Y > 75%			

TWO SITUATIONS / THREE CASE SCENARIOS



RESULTS

BAD WATER QUALITY

Worst	TN	TP	Cl^-	SO_4^{2-}
Average	TN	TP	Cl^-	SO_4^{2-}
Real	TN	TP	Cl^-	SO_4^{2-}

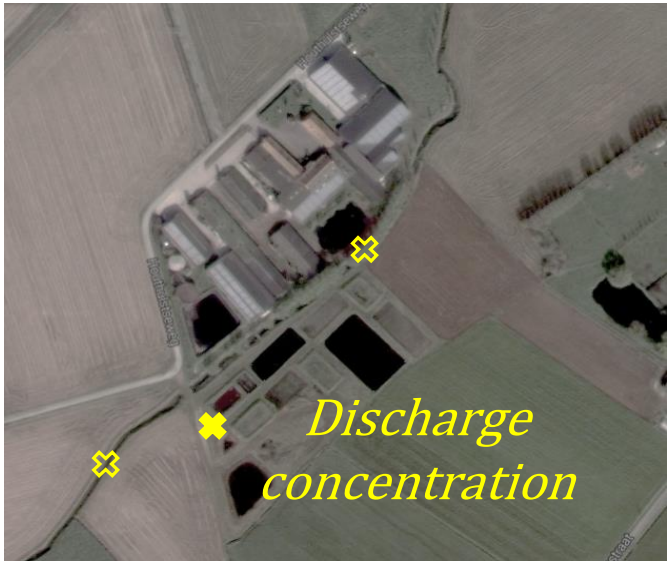
GOOD WATER QUALITY

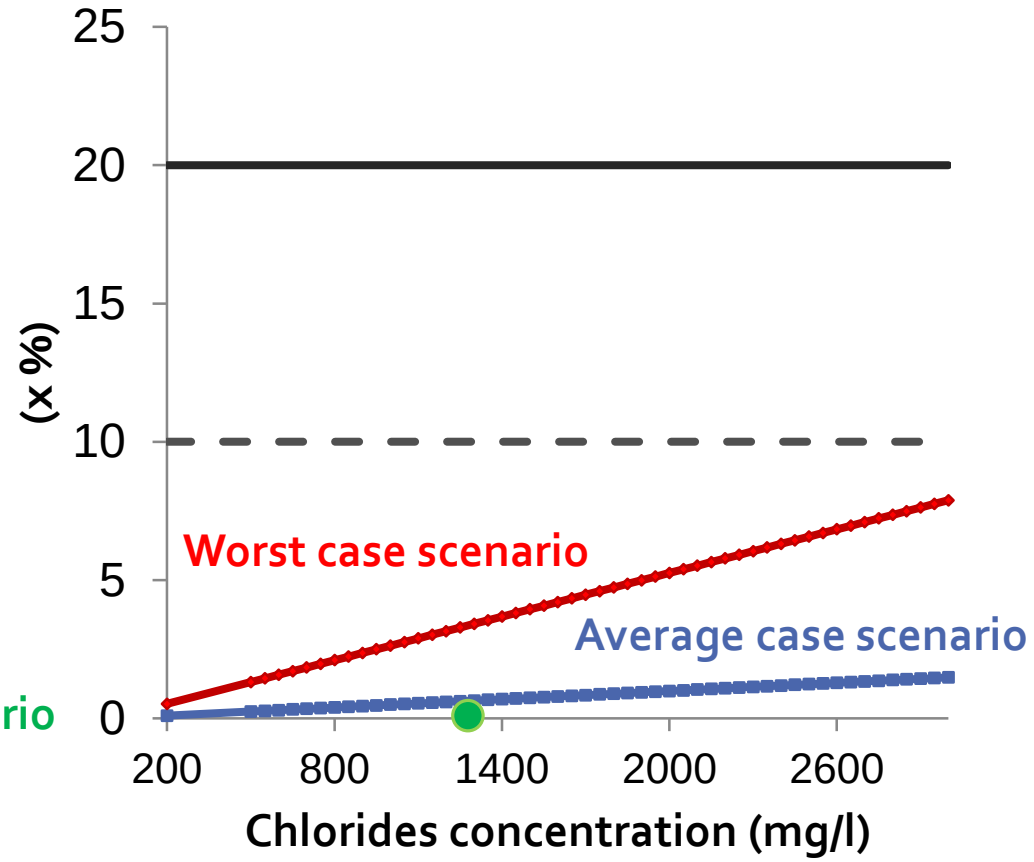
Worst	TN	TP	Cl^-	SO_4^{2-}
Average	TN	TP	Cl^-	SO_4^{2-}
Real	TN	TP	Cl^-	SO_4^{2-}

- Relevant
- Limited
- No Contribution

Standard Framework

3. Sensitivity analysis (Cl^-)





Standard Framework

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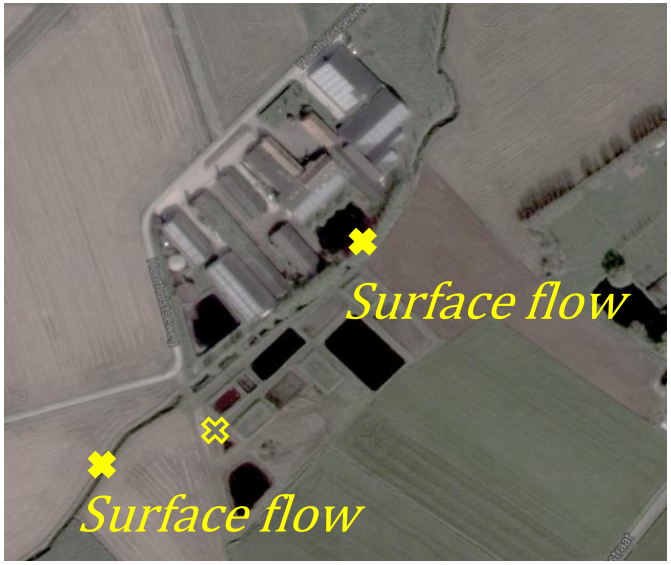

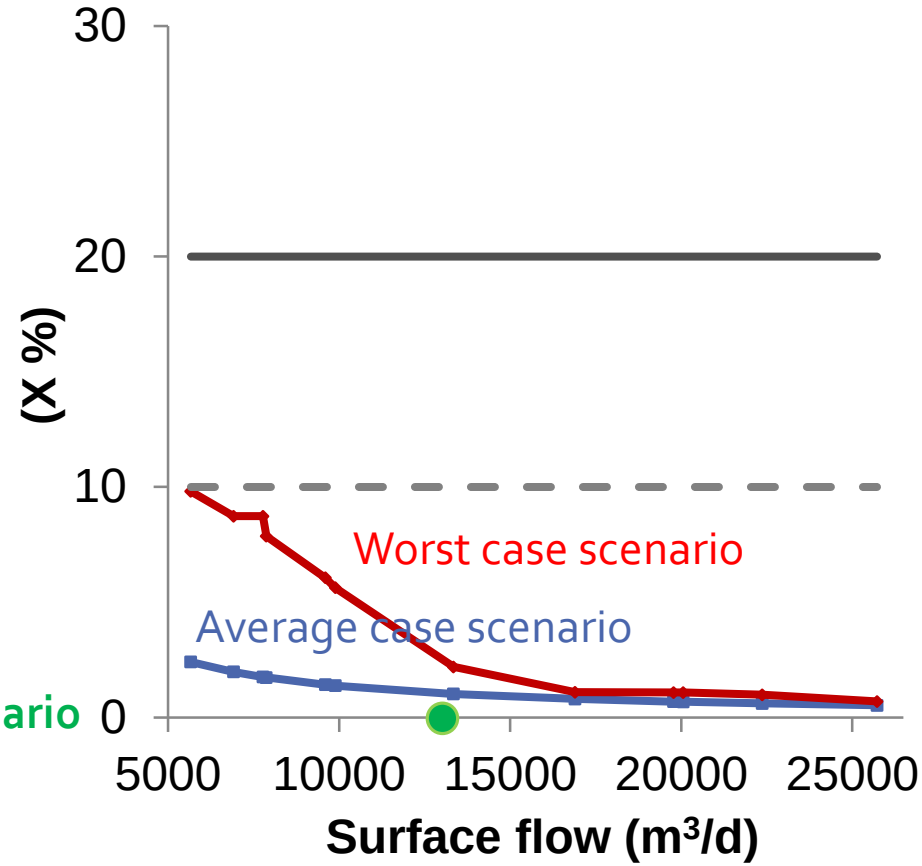

Standard Framework

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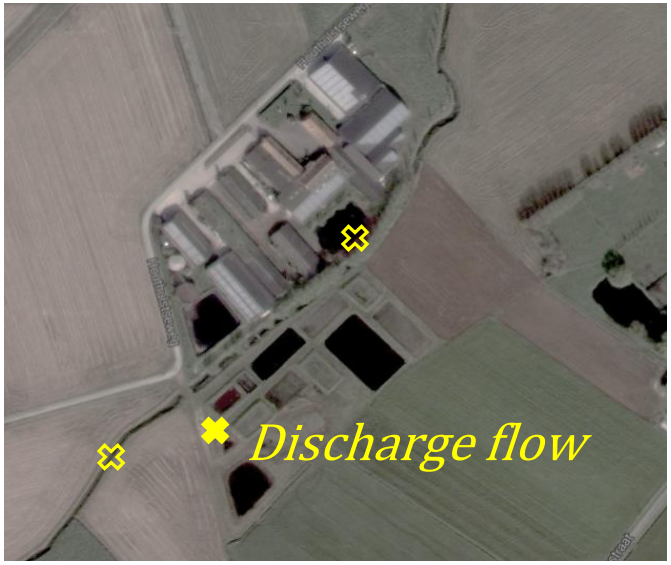

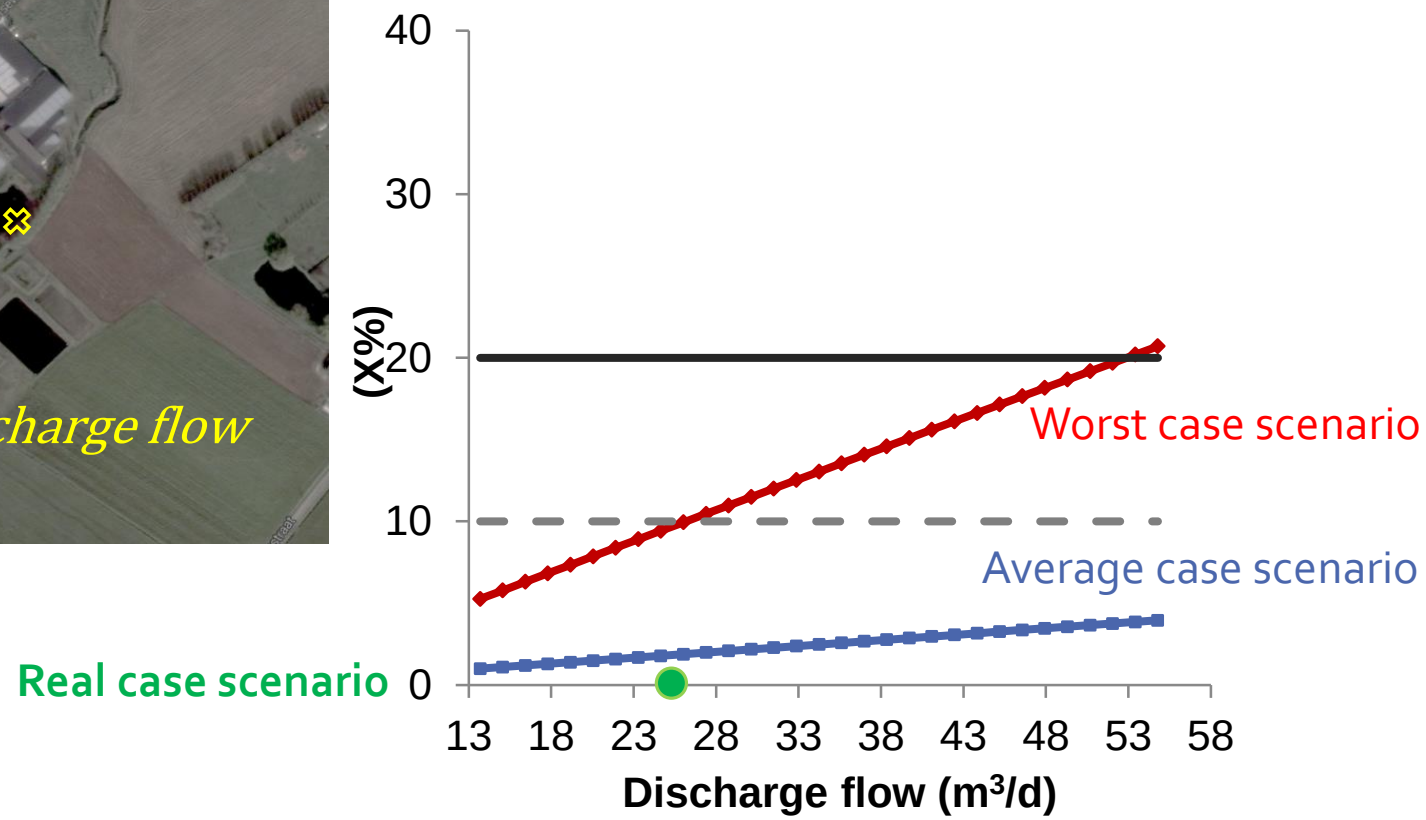

CLOSING REMARKS

Site-specific analyses

- Weather conditions
- Monitoring stations
- Anthropogenic pressures
- Clear method

Mitigating Measures

- Rain water harvesting
- Buffer or reserve pond

Standard limits based on literature vs. appropriate limits

Further questions

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Water Air Soil Pollut (2015) 226:205
DOI 10.1007/s11270-015-2465-8

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