FAIRWAY introduction

Gerard Velthof, Wageningen Research

FAIRWAY
Farm System Management and Governance
for Good Water Quality and Drinking Water Supplies

Funded by the European Union's Horizon 2020 Programme for research & innovation under grant agreement no 727984

General objectives FAIRWAY
(same as WaterProtect)

To contribute to a more effective protection of drinking water resources against nitrate and pesticide pollution from agriculture

by identification and further development of innovative measures and governance approaches,

together with relevant local, regional and national actors.

Period 1 June 2017 – 31 November 2021 (extended with 6 months)

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FAIRWAY: 22 partners in 11 countries

Partner	Acronym	Country
Wageningen Research	WUR	NL
RoyalHaskoning-DHV	RHDHV	NL
Wageningen University	WU	NL
BRGM	BRGM	FR
Landbrug/SEGES	SEGES	DK
NIVA	NIVA	NO
Univerza v Ljubljani	UL	Sl
Fondazione per lo Sviluppo Sostenibile del Mediterraneo	MEDES	IT
CLM	CLM	NL
Thünen Institute	Thuenen	DE
Coimbra Polytechnic Agri. School	IPC/ESAC	PT
University Lincoln	UoL	UK
ICPA	ICPA	RO
Aristotle University of Thessaloniki	AUTH	EL
Agri-Food & Biosciences Institute	AFBI	UK
Aarhus University	AU	DK
GEUS	GEUS	DK
RIVM	RIVM	NL
Kmetijsko gozdarski zavod Maribor	KGZ Maribor	Sl
ADAS	ADAS	UK
LWK (Chamber of Agriculture)	LWK	DE
Scienceview Media B.V.	Scienceview	NL

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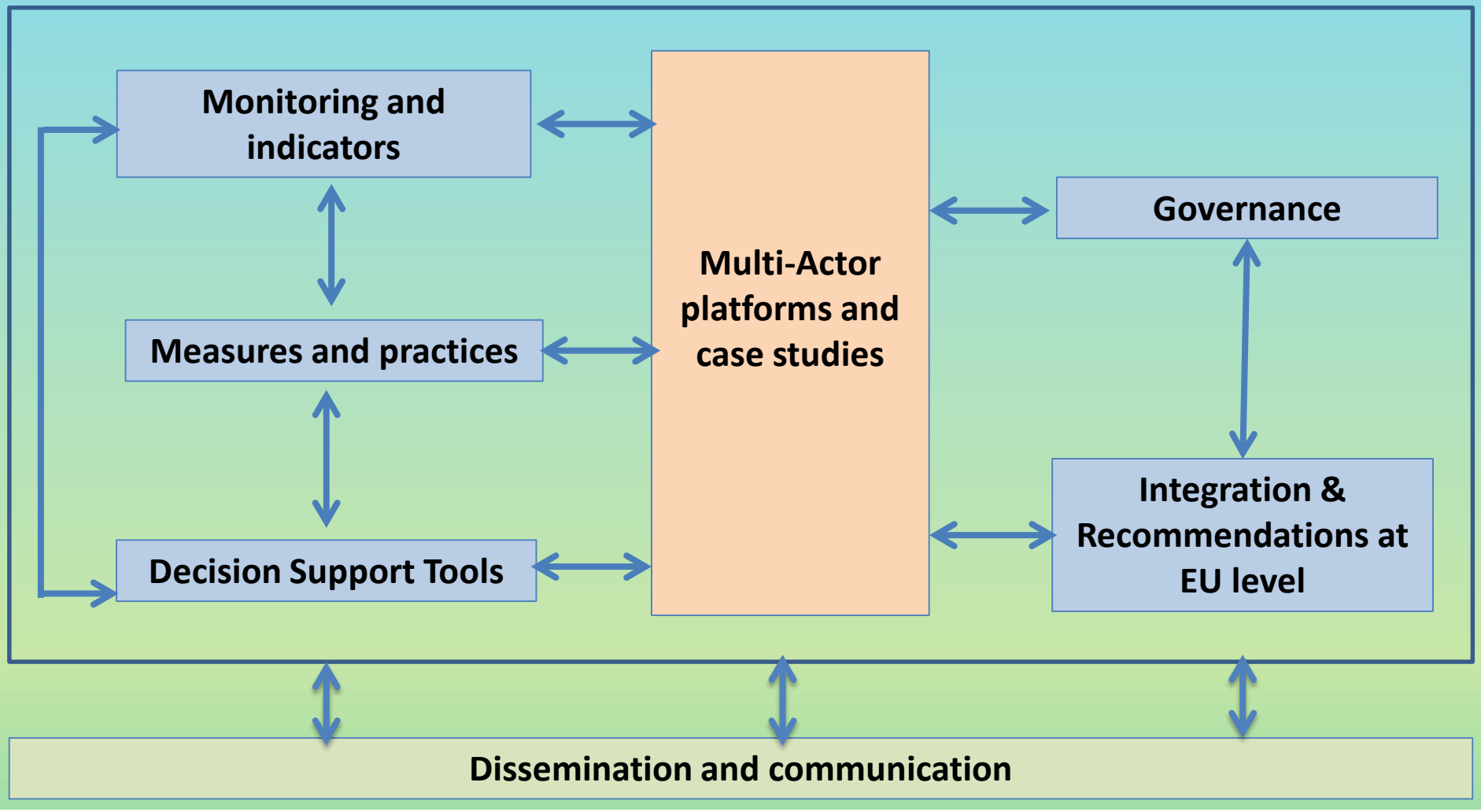
FAIRWAY approach



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13 case studies in 11 countries

1 Island Tunø, Denmark
2 Aalborg, Denmark
3 Anglian Region, England
4 La Voulzie, France
5 Lower Saxony, Germany
6 Axios river, Greece
7 Derg catchment, Northern Ireland
8 Overijssel, Netherlands
9 Noord-Brabant, Netherlands
10 Vansjø, Norway
11 Baixo Mondego, Portugal
12 Arges-Videa, Romenia
13 Dravsko Polje, Slovenia

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A few results

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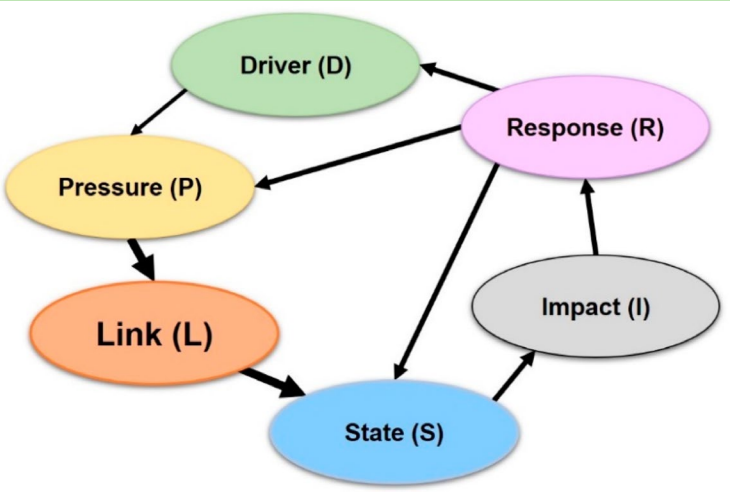
Link indicator: lag time between agriculture pressure and water quality

- The lag time between soil N surplus and groundwater chemistry was analyzed using a cross correlation in three case study sites

- Lag time increased with an increasing distance from the N source
  - Tunø (DK): from 0 to 20 years between 1.2 and 24 m below surface
  - Voulzie (Fr): from 8 to 24 years along downstream
  - Aalborg-Drastrup (DK): large variability in lag time with depth

- Lag time may be a useful indicator for the hydrogeological links between agricultural pressure and water quality



Kim, H.; Surdyk, N.; Møller, I.; Graversgaard, M.; Blicher-Mathiesen, G.; Henriot, A.; Dalgaard, T.; Hansen, B. Lag Time as an Indicator of the Link between Agricultural Pressure and Drinking Water Quality State. Water 2020, 12, 2385.

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Nitrogen Surplus—A Unified Indicator for Water Pollution in Europe?

- Survey in 14 EU countries on N surplus as indicator for water pollution
- No unified methodology available: methods and data vary across countries
  - ➢ Comparison of budgets needs careful interpretation
- Only by using farm-specific "real" data, budgeting can be successfully applied at farm level
- In EU, environmental policies N budgeting is ruled out; N budgets are used as agri-environmental indicator by OECD and Euro[illegible]

Klages, S.; Heidecke, C.; Osterburg, B.; Bailey, J.; Calciu, I.; Casey, C.; Dalgaard, T.; Frick, H.; Glavan, M.; D'Haene, K.; Hofman, G.; Leitão, I.A.; Surdyk, N.; Verloop, K.; Velthof, G. Nitrogen Surplus—A Unified Indicator for Water Pollution in Europe? Water 2020, 12, 1197.

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Decision Support Tools (DST)

- More than 150 DST identified; 36 further analyzed
  - ➢ Most tools were nutrient/pesticide management tools
  - ➢ Only three tools explicitly considering water quality

- 12 tools were tested at nine diverse case study sites:
  - ➢ obstacles to exchange tools between countries: differences in legislation, advisory frameworks, country-specific data, geo-climate and language
  - ➢ Good support and advice from well-educated skilful advisors are highly valuable for the end user to make the right decisions

Nicholson, F.; Krogshave Laursen, R.; Cassidy, R.; Farrow, L.; Tendler, L.; Williams, J.; Surdyk, N.; Velthof, G. How Can Decision Support Tools Help Reduce Nitrate and Pesticide Pollution from Agriculture? A Literature Review and Practical Insights from the EU FAIRWAY Project. Water 2020, 12, 768.

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A likely successful DST

USE

- Continuous update, improvement and maintenance of software
- Direct assistance from advisor with appropriate training
- Supplementary information in national language

ACCESS

- Free availability of DST (preferably online)
- Open source format
- Supplementary data free and easily available

FUNCTIONALITY

- Simple and self-explanatory but still able to handle complexity
- Centralized and holistic approach
- Integrate ”smaller” DSTs into a single DST
- Flexibility of data input and output
- ”Reality” and consistency checks included
- Clear references of data sources

OUTPUT

- Information on whether regulations are met
- Trustworthy, reliable and clear results and recommendations
- Visualization of data (graphical)
- (Financial) gain for end users
- Public recognition

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Review of EU directives and policies for the protection of drinking water resources

- Water Framework Directive (WFD), Groundwater Directive, Drinking Water Directive (DWD), Nitrates Directive (ND) and Pesticides Directive

- The overall legal framework is likely to be fit for purpose, but potential inconsistencies and gaps were identified, such as:
  - Risk-based approach DWD versus protection of water resources (WFD)
  - Drinking water quality objectives (ND) versus ecological objectives (WFD)
  - Counterproductive legislation by fixed threshold values, such as 170 kg N per, 50 mg/l nitrate and 0,1 ug/l pesticides
  - Possible negative effects of the CAPs funding mechanism on the protection of drinking water resources

Platjouw et al. FAIRWAY report

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Workshop during Conference on Land Use and Water Quality

Main barriers for creating safe drinking water resources

- Financial barriers (lack of funding) to apply certain measures
- (Lack of) enforcement of rules
- Site specific aspects; best managed practice is often to general

Main solutions for creating safe drinking water resources

- More effective enforcement
- Subsidies to apply certain measures
- More collaboration between farmers, scientists, stakeholders and policy makers

29 people from 12 countries participated in the workshop:
7 NL, 5 DE, 4 DK, 2 Sl, 2 NO, 2 CH, 2 GB, 1 LV, 1 FI, I FR, 1 BE, 1 AT

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Workshop during Conference on Land Use and Water Quality

Main measures to decrease nitrate leaching

- Changes in farm structure, e.g. crop rotation
- Balanced nitrogen fertilization
- Buffer strips and riparian zones along water courses

Main measures to decrease pesticides leaching

- Integrated Pest management; combination of measures at farm
- Row application, lower dose, better timing
- Choice for alternative, less harmful pesticides

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Planning FAIRWAY

- Deliverables and scientific papers, e.g.
  - Analysis of the Multi-Actor Platforms in the different case studies
  - Measures to reduce leaching of nitrate and pesticides
  - Water Safety Plans
  - Governance

- Synthesis of the work
  - Recommendations
  - Interaction with policy makers and stakeholders

- Final meeting at Conference Land Use and Water Quality in Maastricht (NL) in September 2021

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Thank you!

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