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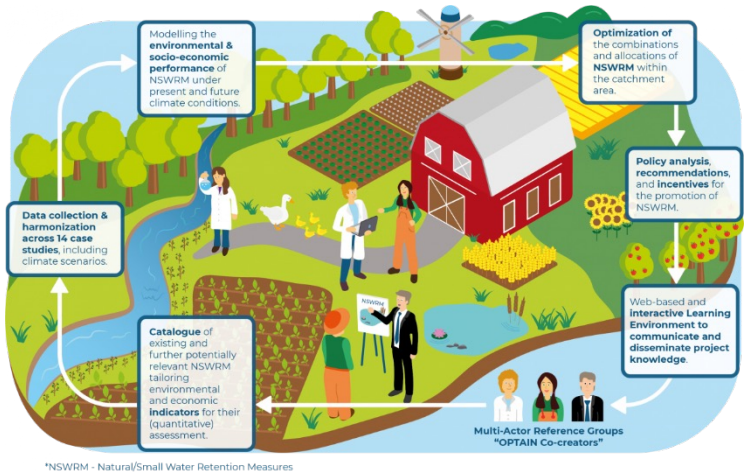
OPtimal strategies to retAIN and re-use water and nutrients in small agricultural catchments across different soil-climatic regions in Europe



Prof. Dr. Martin Volk

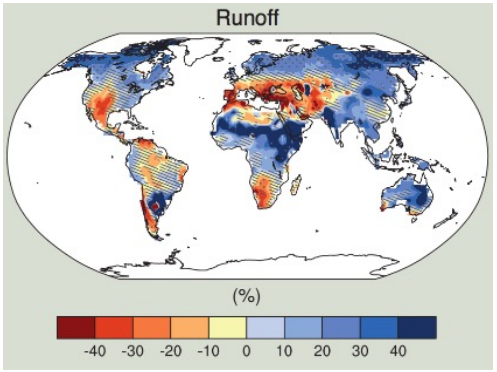
1st OPTAIN Webinar on "Benefits of Natural/Small Water Retention measures" April 30, 2024

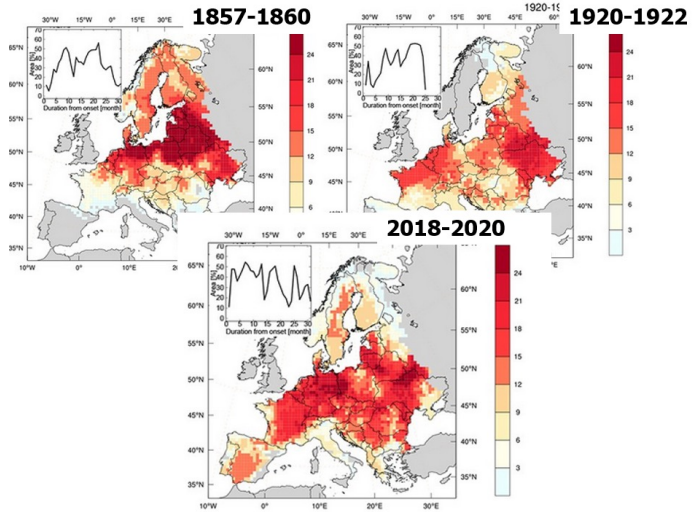
UFZ HELMHOLTZ Centre for Environmental Research

Floods and droughts…increasing number and intensity!

New Drought Benchmark in Europe

The drought event from 2018 to 2020 was the most intense in over 250 years*.





*Source: *Rakovec et al.*, 2022: The 2018-2020 Multi-Year Drought Sets a New Benchmark in Europe. Earth's Future 10(3): e2021EF002394

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Floods and droughts…increasing number and intensity!

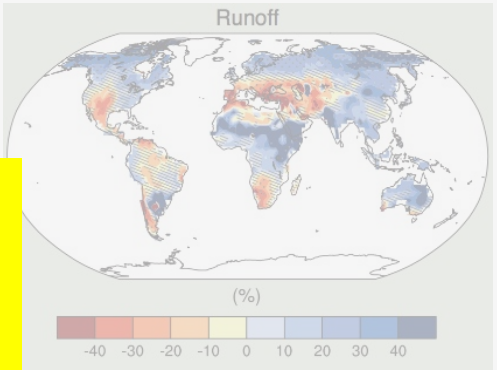
New Drought Benchmark in Europe
The drought event from 2018 to 2020 was the most intense in over 250 years*.

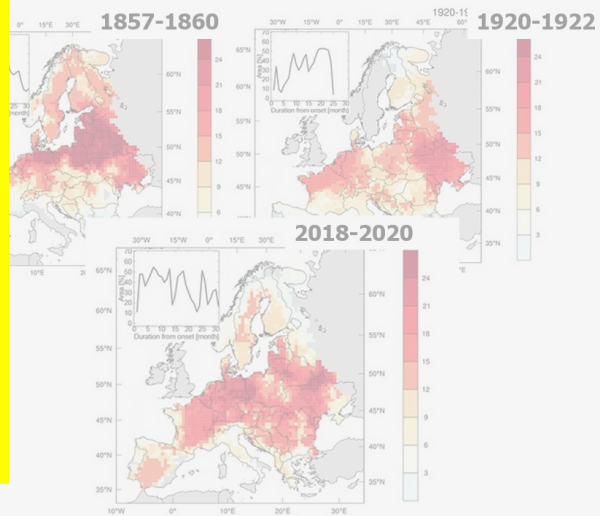
Impacts on
Agricultural yield (food security!), water availability and quality, biodiversity, daily life, transport,…

Causing
Environmental threats, socio-economic conflicts,..

Need for
Water and nutrient retention in landscapes!

.. any impacts in your home region?



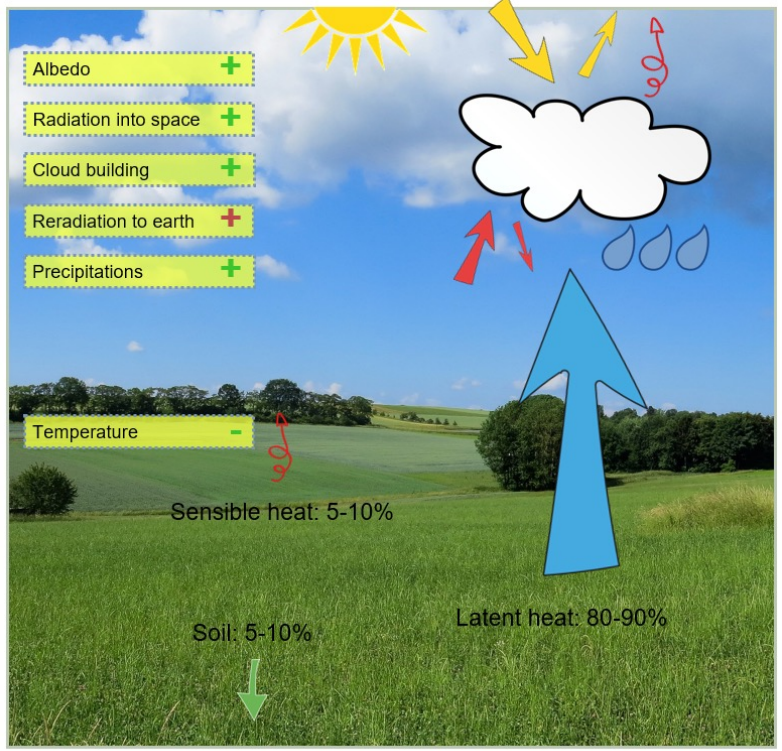


*Source: Rakovec et al., 2022: The 2018-2020 Multi-Year Drought Sets a New Benchmark in Europe. Earth's Future 10(3): e2021EF002394

The special challenge - agricultural areas

..food supply, economy, subsidies, large proportion of land, („shaping the quality of landscapes"), water, biodiversity,..

Energy dynamics



Pokorny, J., 2019. Evapotranspiration, in: Encyclopedia of Ecology. Elsevier, pp. 292–303

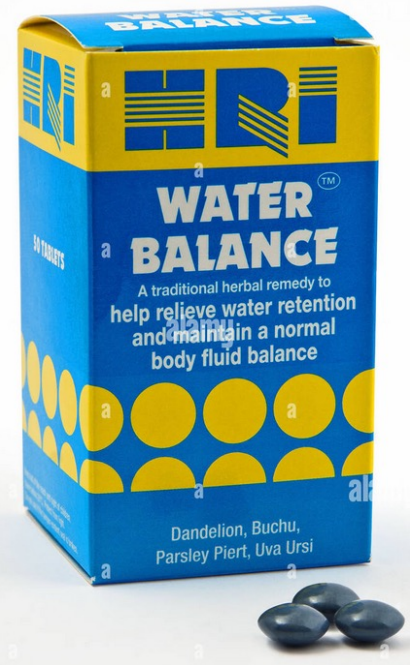
UN environment programme

The huge potential of agriculture to slow climate change

© Stefan Schwarzer

What can we do to keep water and nutrients in the landscape…? ..

..and at the same time create benefits for all the other ecosystem functions under stress (e.g. biodiversity)?

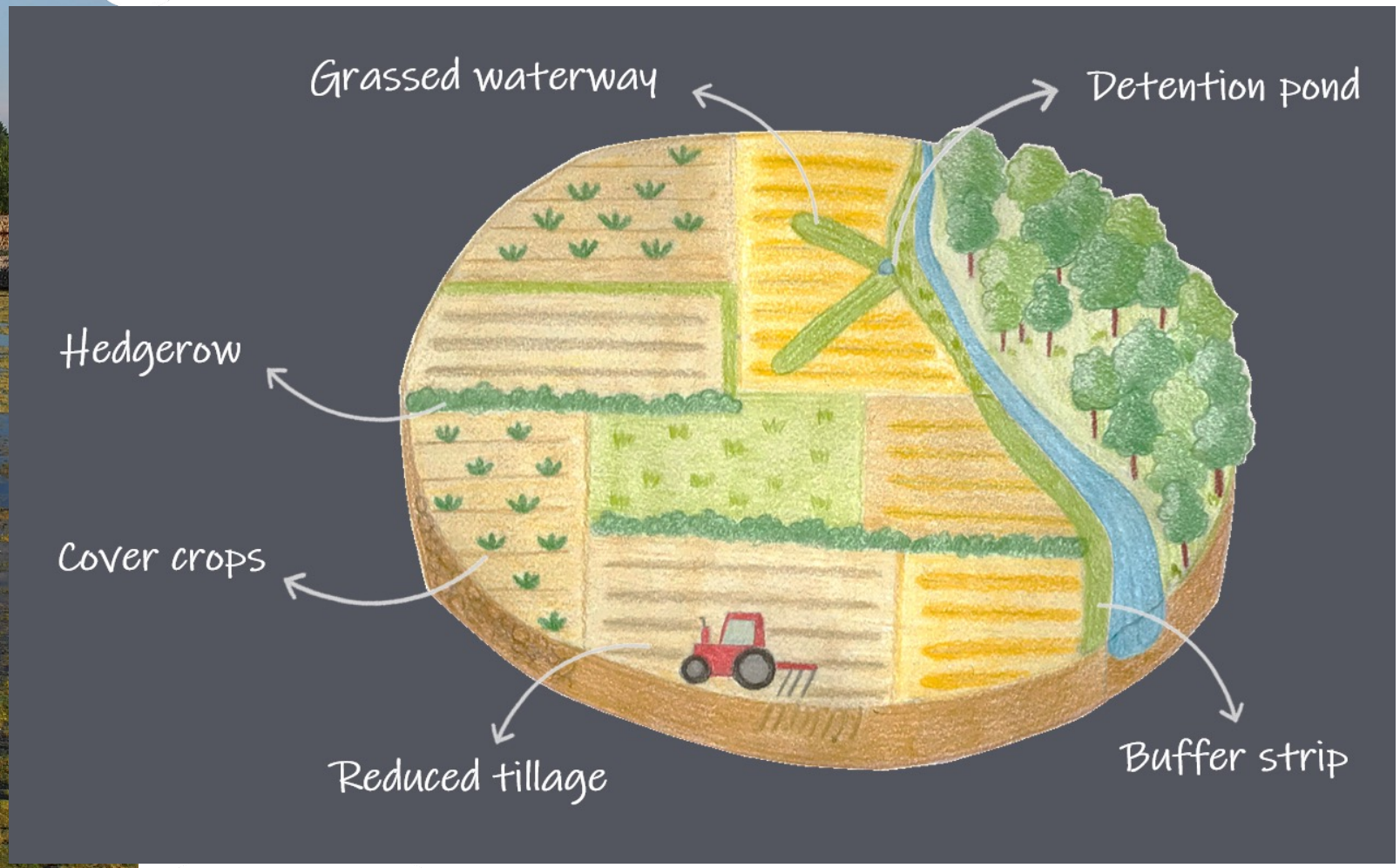


Natural / Small Water Retention Measures

(NSWRM)

Measures which positively affect water use efficiency of the agricultural production

(Agricultural, hydro-morphological and small technical measures)



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Measures which positively affect water use efficiency of the agricultural production

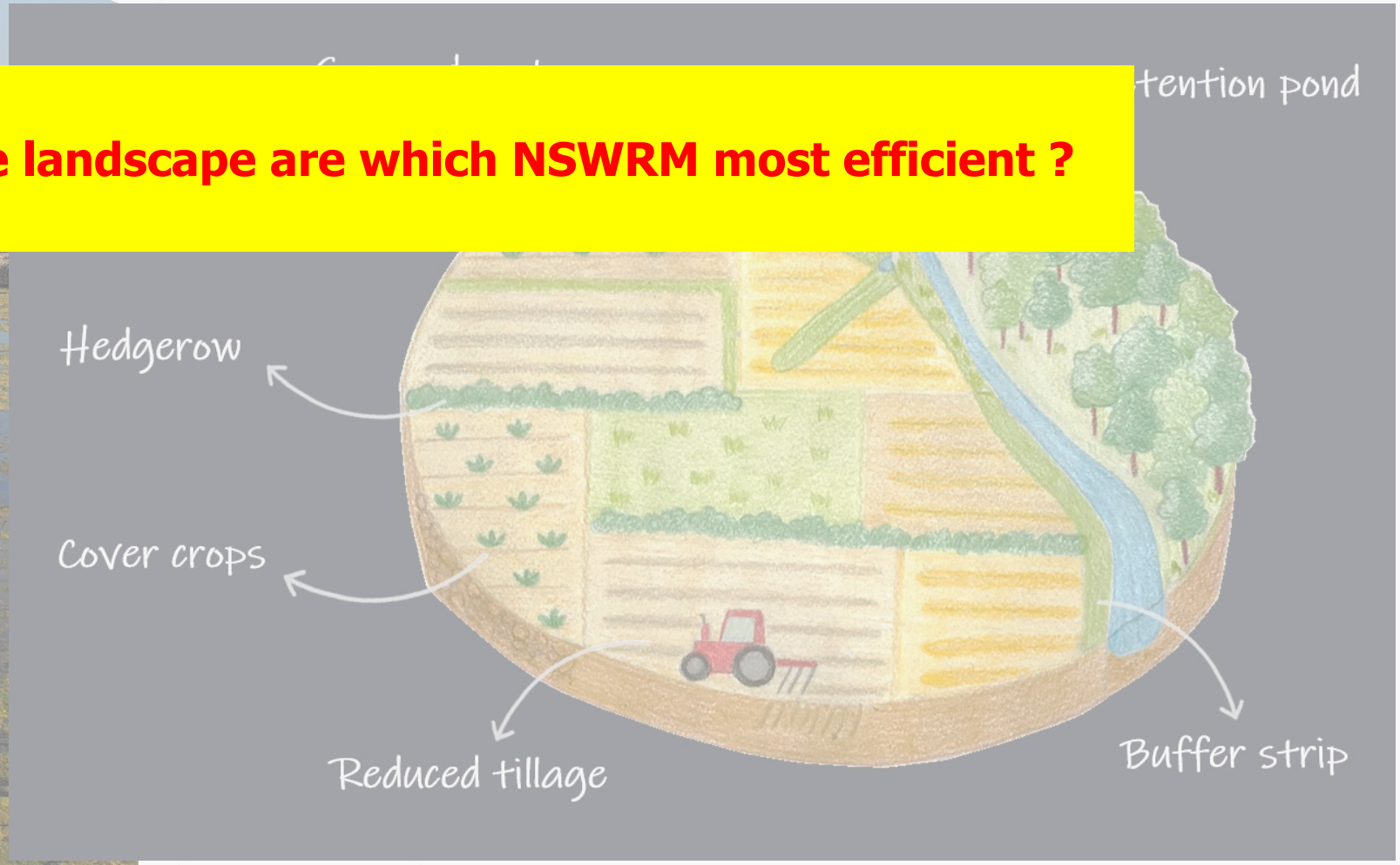
(Agricultural, hydro-morphological and small technical measures)

Na

Retention Measures

(NSWRM)

..but where in the landscape are which NSWRM most efficient ?



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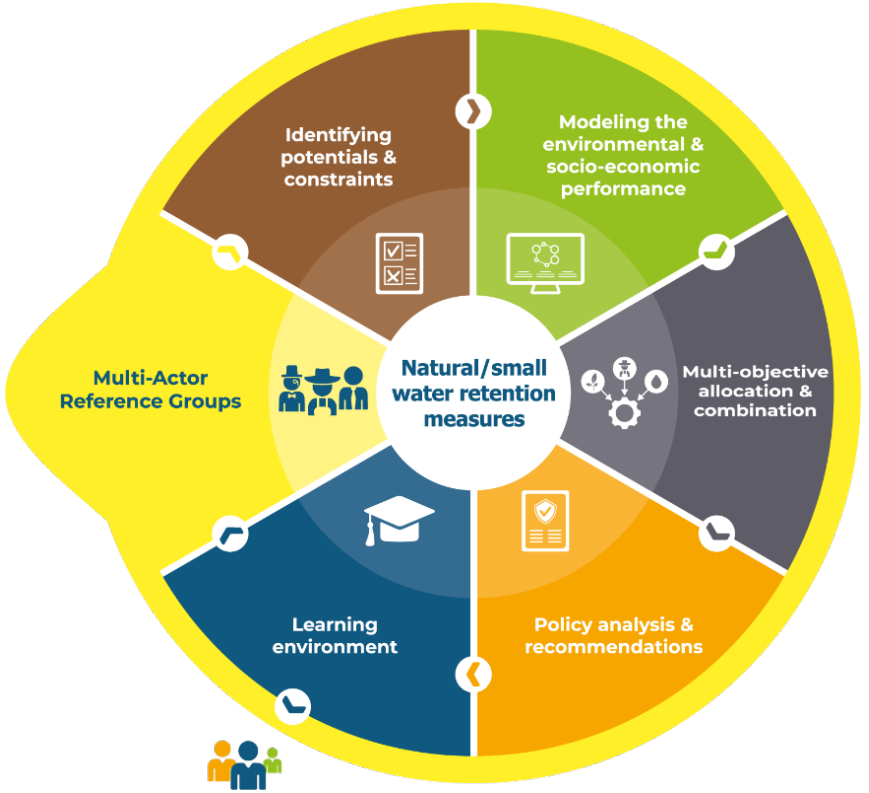
..that’s where the EU project OPTAIN comes into play..

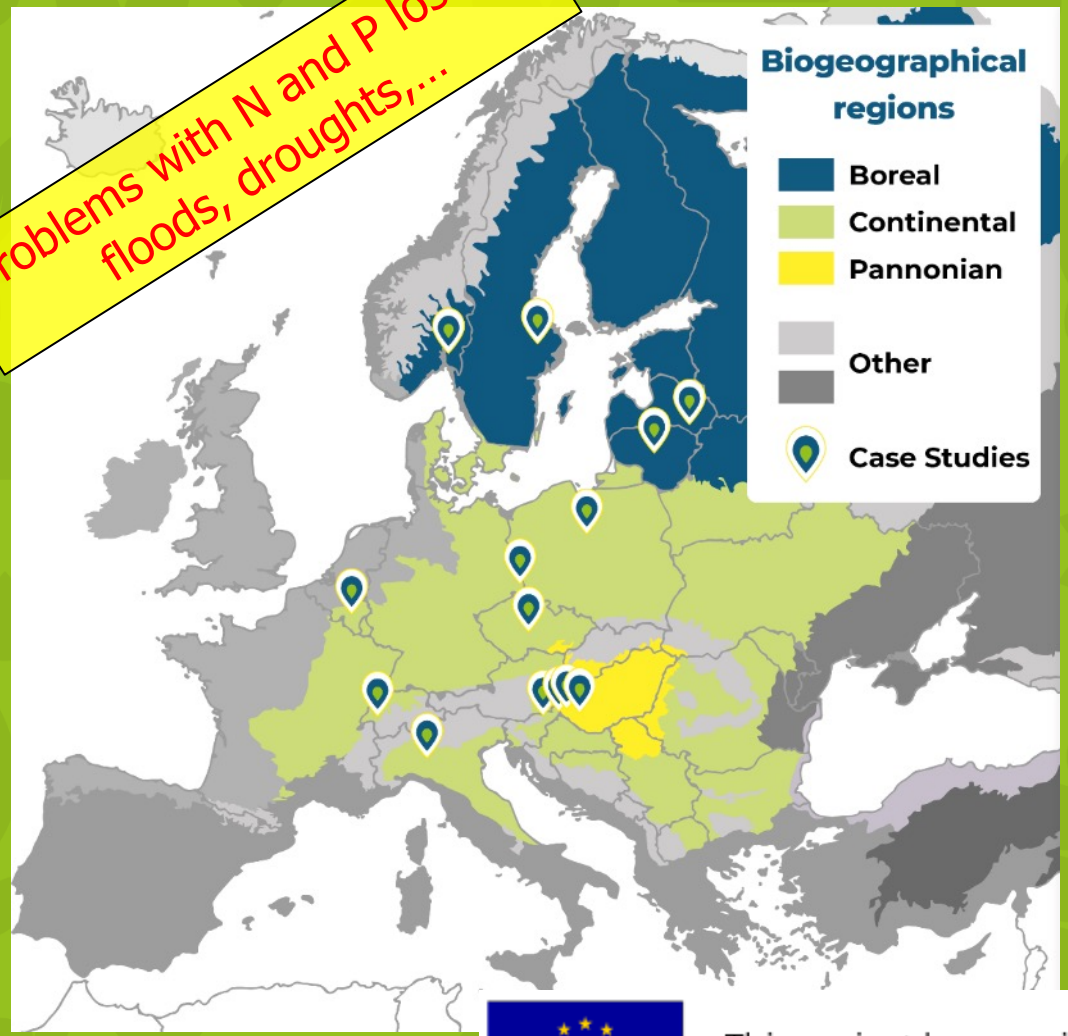
OPTAIN objectives

- Identify **regional conditions** under which Natural / Small Water Retention Measures perform most efficient
  - **Fully harmonized approach** across all 14 case studies
- Identify **optimal combinations** of NSWRM on **different scales**

The main focus of OPTAIN: use of water and nutrient retention measures in solving agricultural and environmental water management issues.



Project information



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EU Horizon 2020 Research & Innovation project

Call: H2020-SFS-2018-2020 (Sustainable Food Security)

Budget: 7 Million Euro

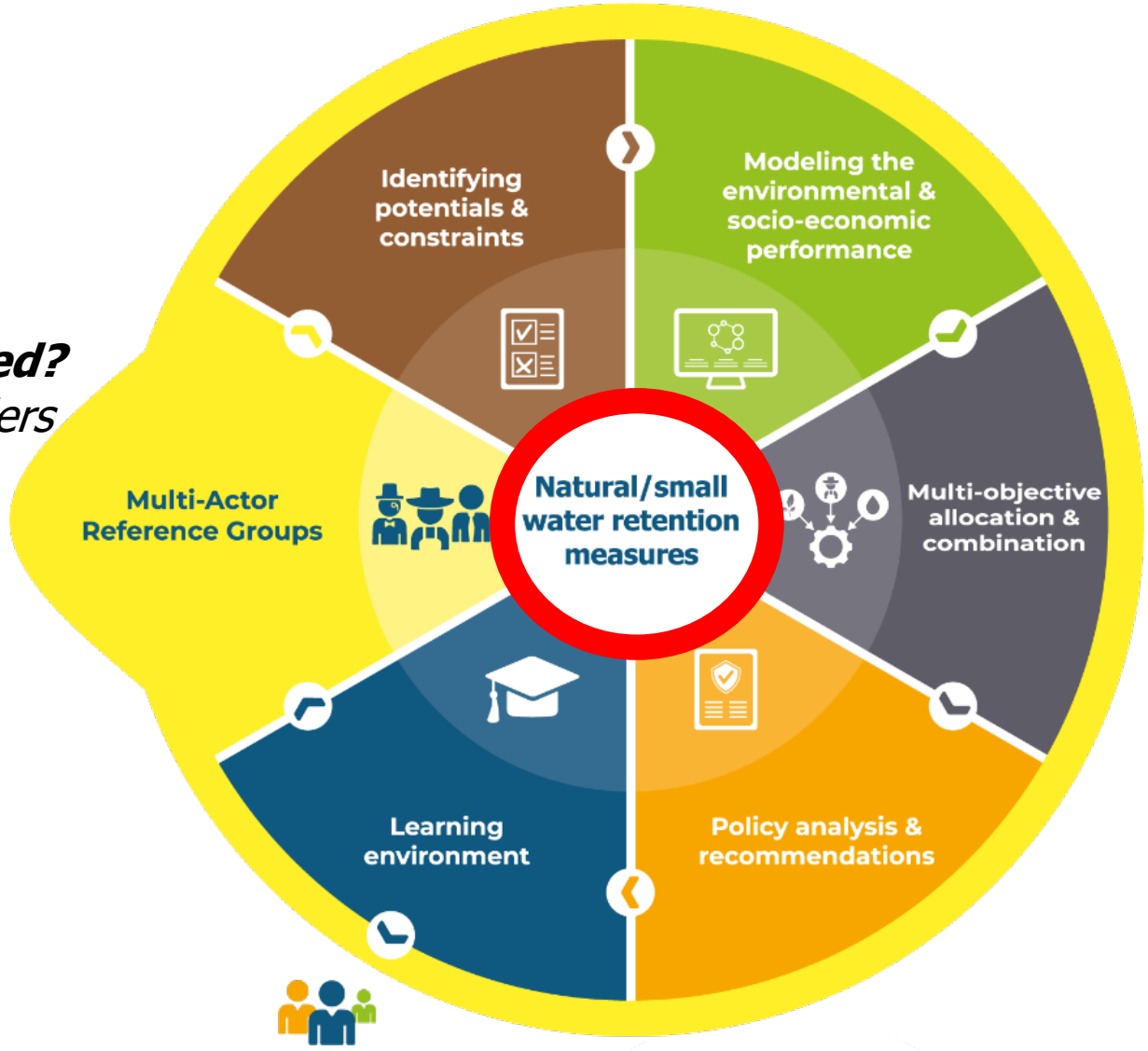
Start: September 2020, 5 years duration

Coordination: Helmholtz-Center for Environmental Research (Germany)

21 Partners from 14 countries & 14 case studies

This project has received funding from the European Union's Horizon 2020 research and innovation program under grant agreement No. 862756.

Who is involved?
>200 stakeholders



What is the problem?

Droughts, floods, erosion, water qulality,..

Who is involved?

>200 stakeholders

OPTAIN

What are the measures?

235 NSWRM, 66 prioritized

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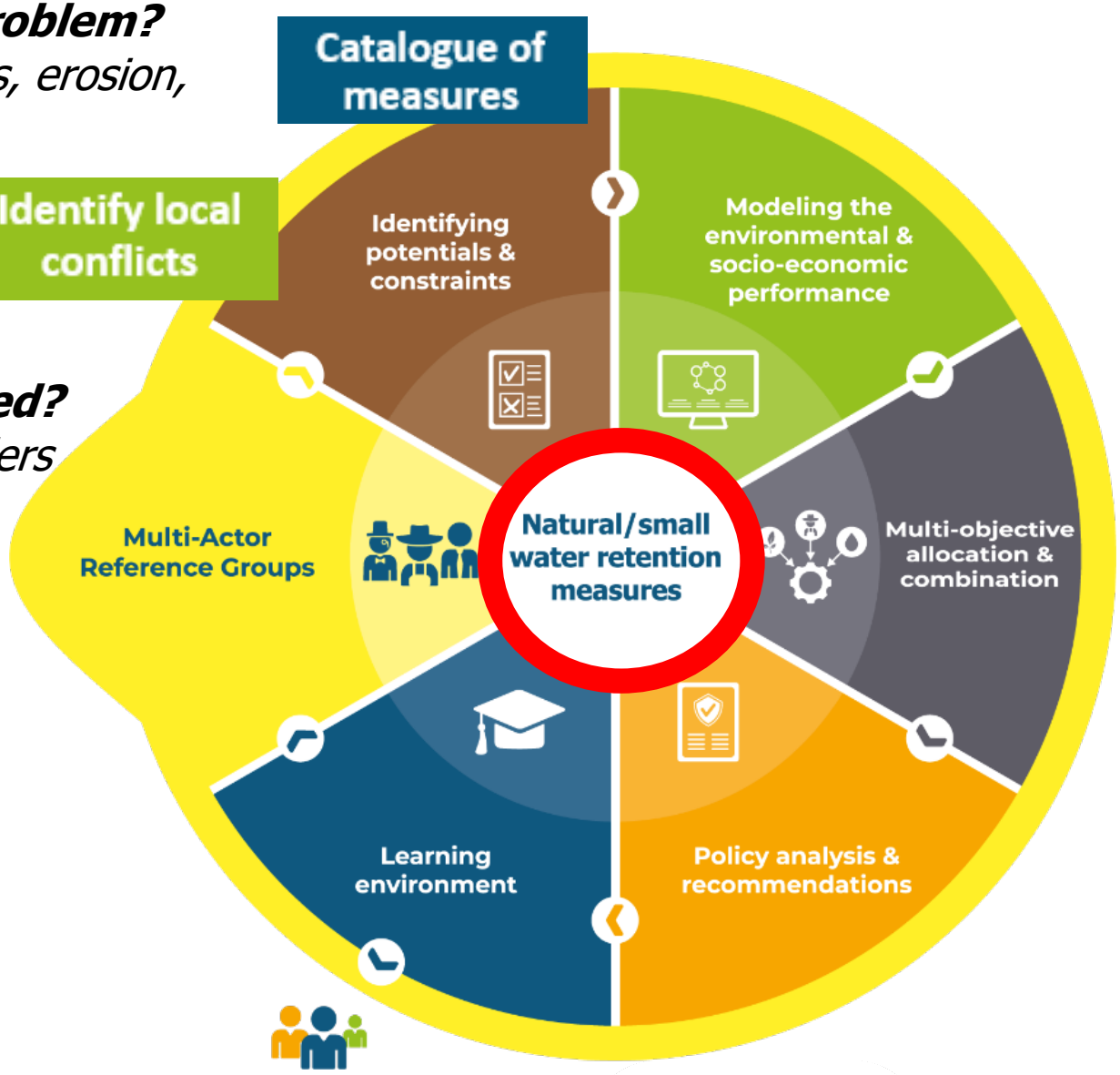

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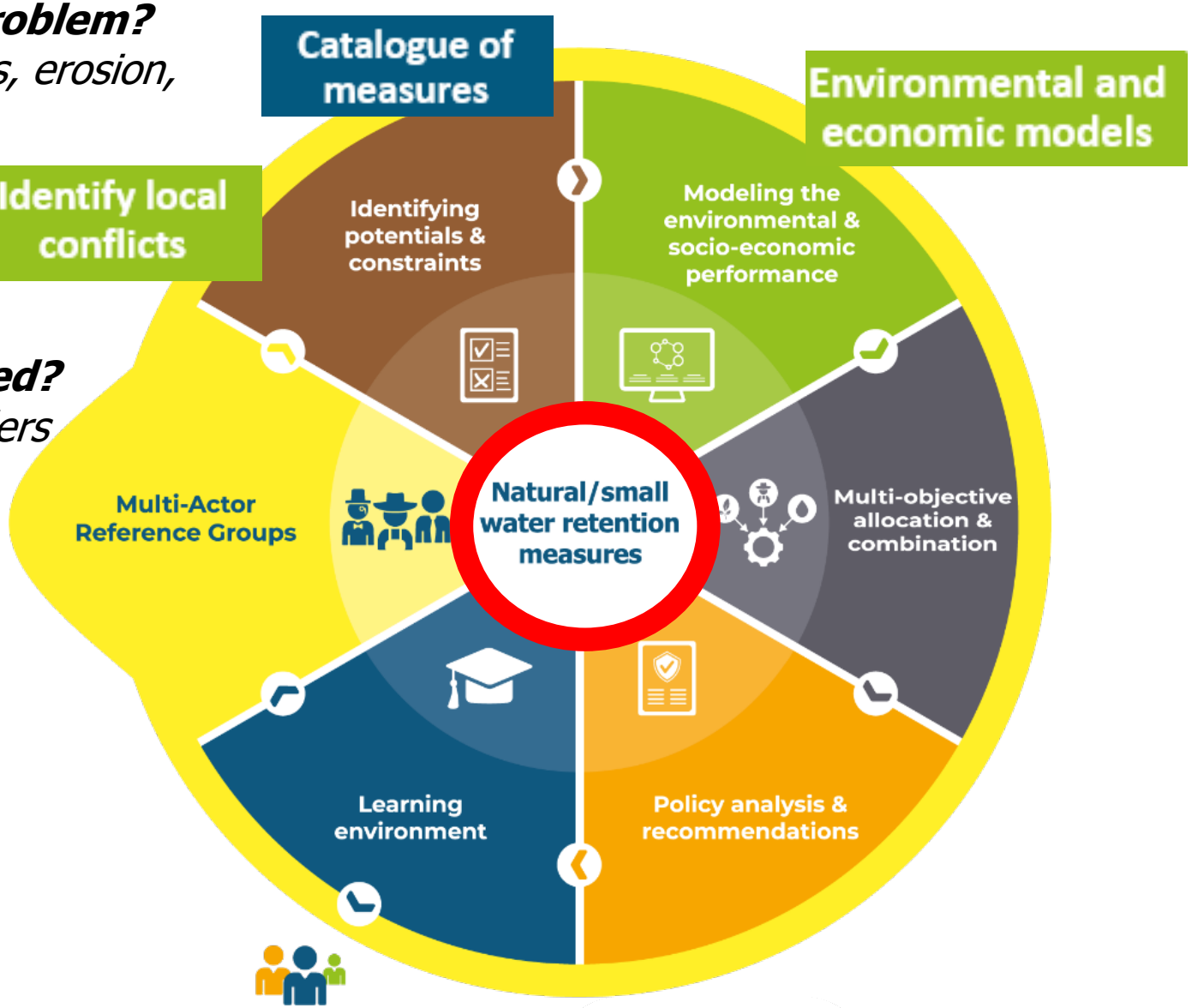

How efficient are the measures?
First SWAT+ results!
Conservation tillage, grassed waterways,..

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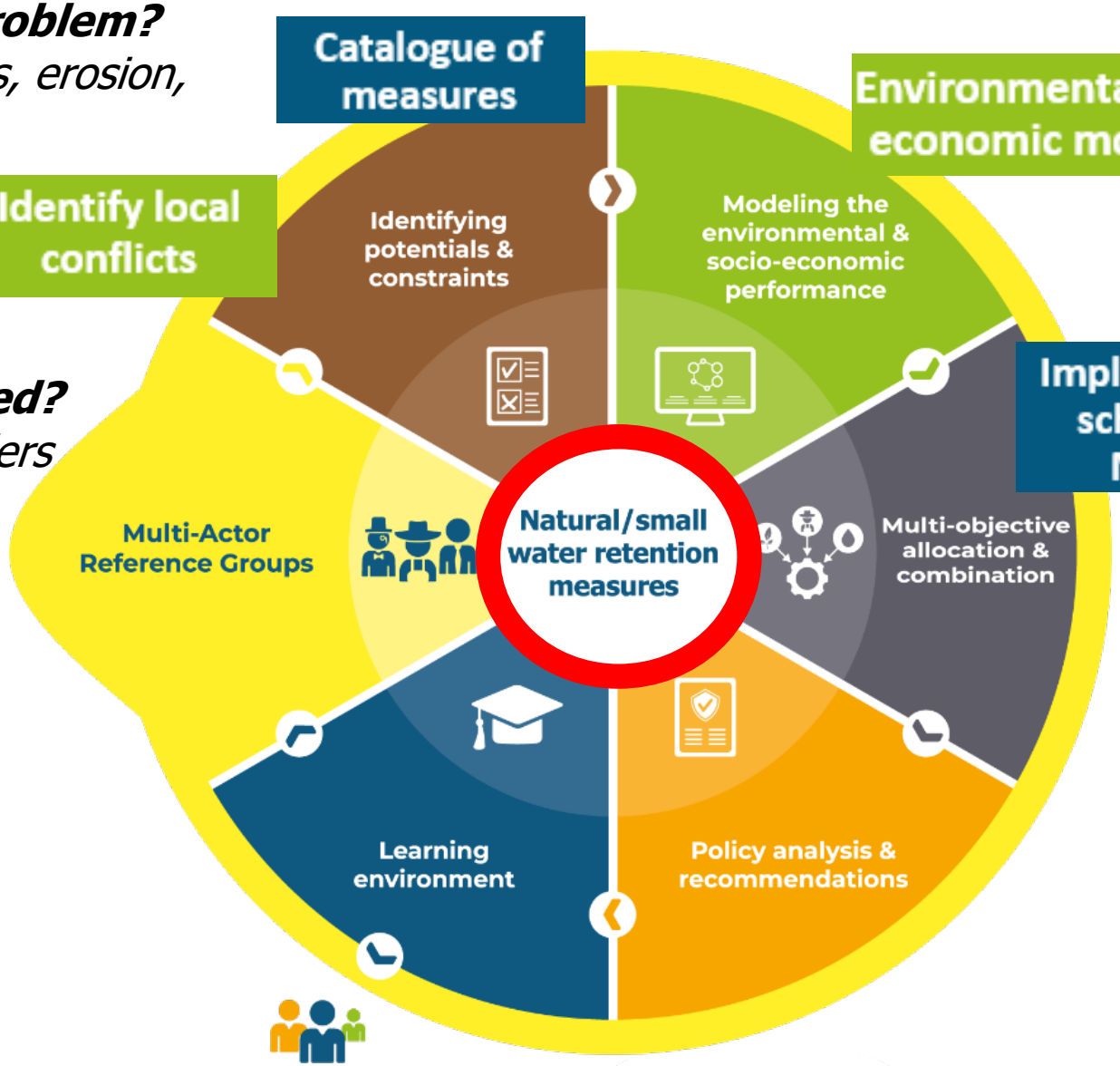

Where to place them to be most efficient?
Focus of this year!

What are the measures?
235 NSWRM, 66 prioritized

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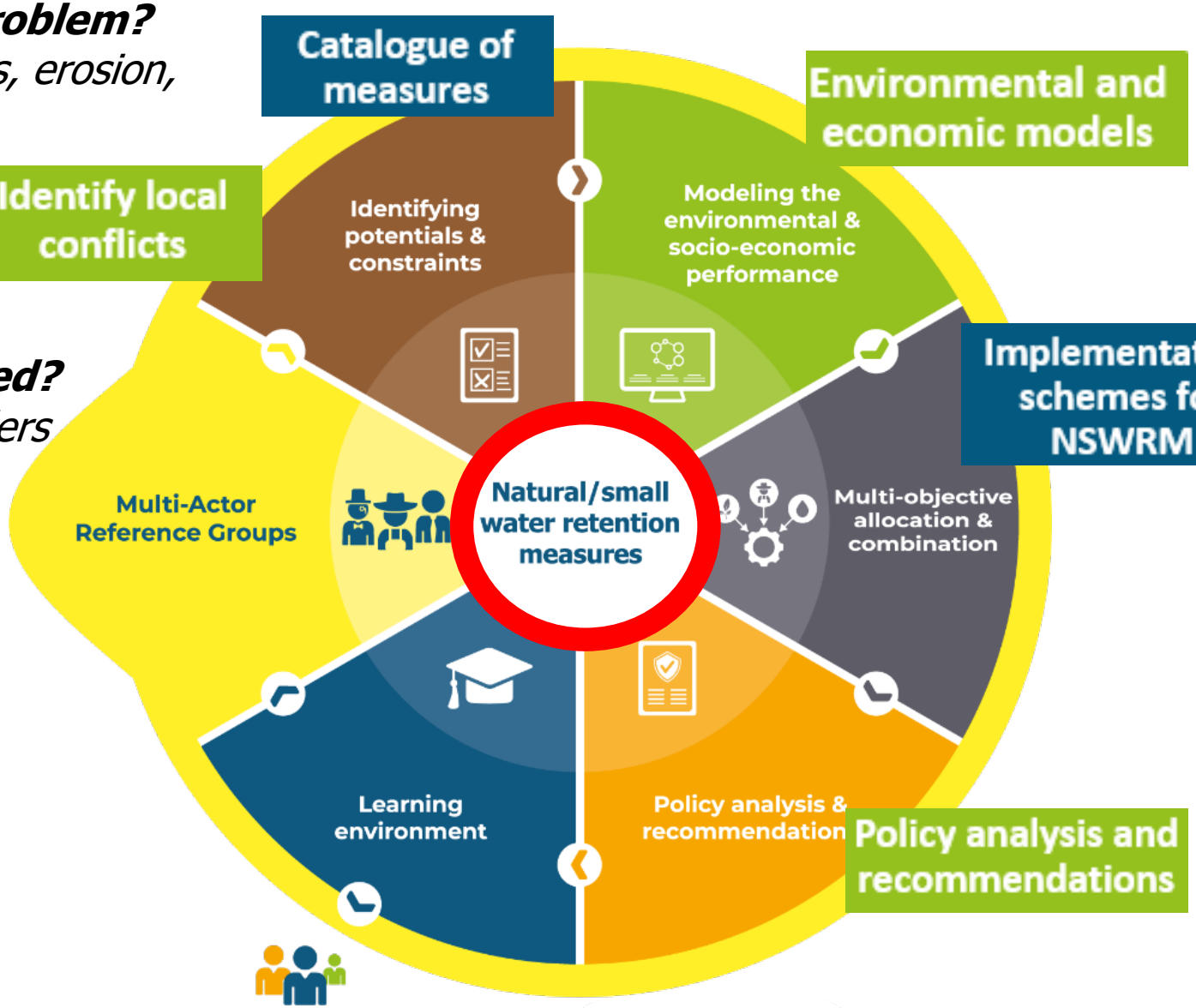

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Focus of this year!

What needs to be done to get them implemented in practice?
>100 stakeholders have been interviewed, policy briefs,..

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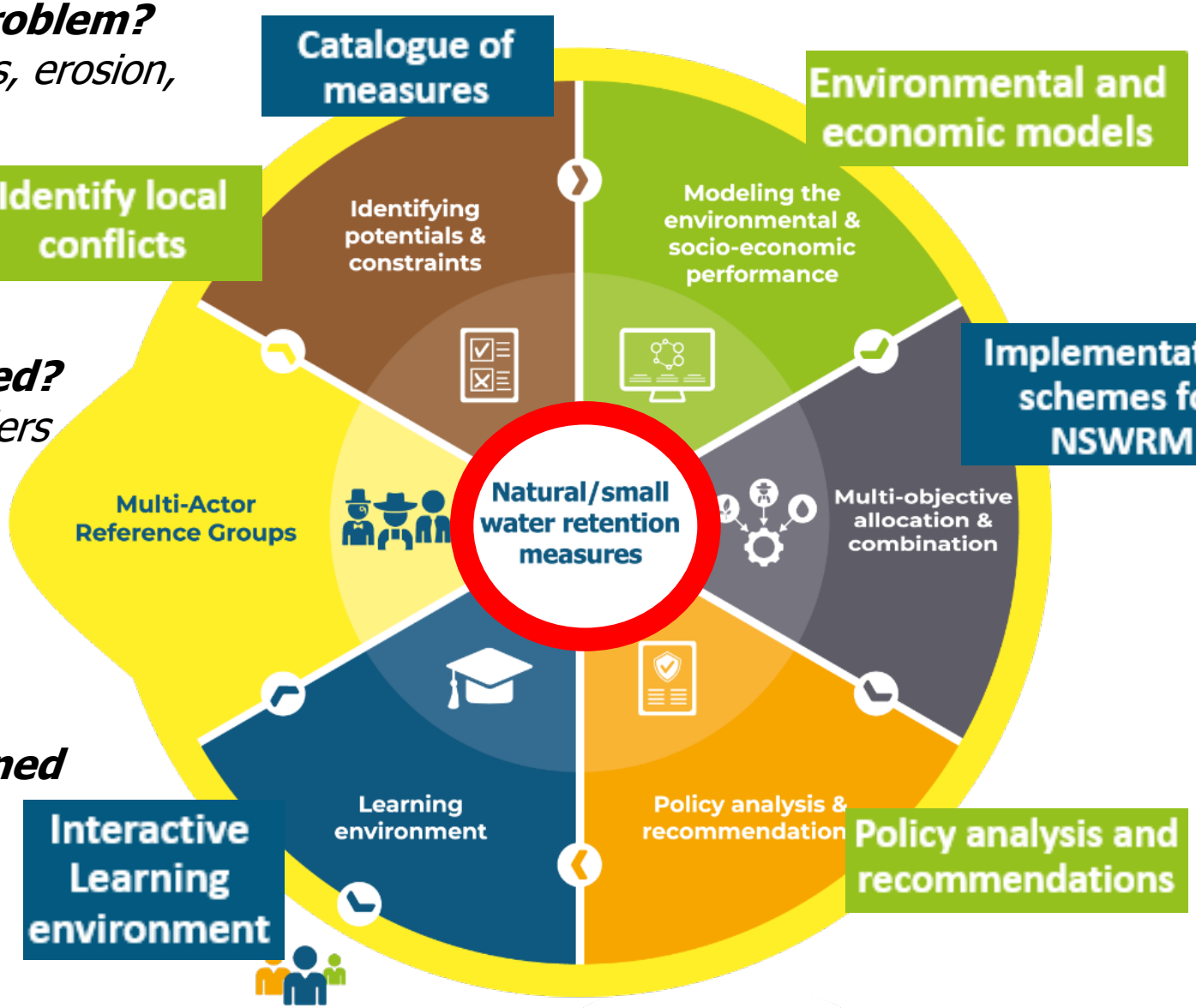


Where to place them to be most efficient?
Focus of this year!

Where is the gained knowledge available, what can be learned?
Ongoing!

What needs to be done to get them implemented in practice?
>100 stakeholders have been interviewed, policy briefs,..

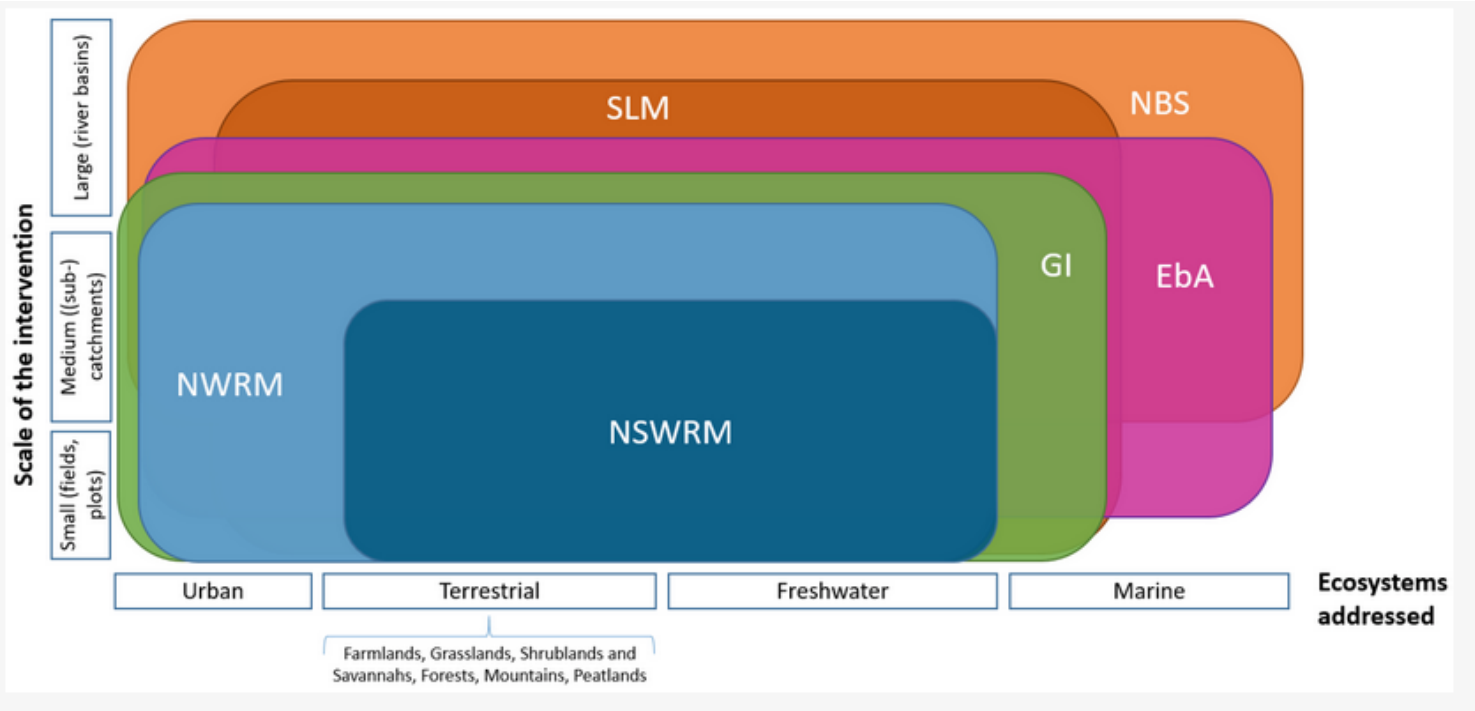
OPTAIN

Sustainability **2024**, *16*(3), 1308; https://doi.org/10.3390/su16031308

Open Access | Perspective

Natural/Small Water Retention Measures: Their Contribution to Ecosystem-Based Concepts

by Julie Magnier [1,*], Benoît Fribourg-Blanc [1], Tatenda Lemann [2], Felix Witing [3,*], William Critchley [4] and Martin Volk [3]



Thank you!

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