

# Participation changed my mindset

Transformative learning about agrobiodiversity in citizen science projects



Frederik Gerits @ Scivil Netwerkdag

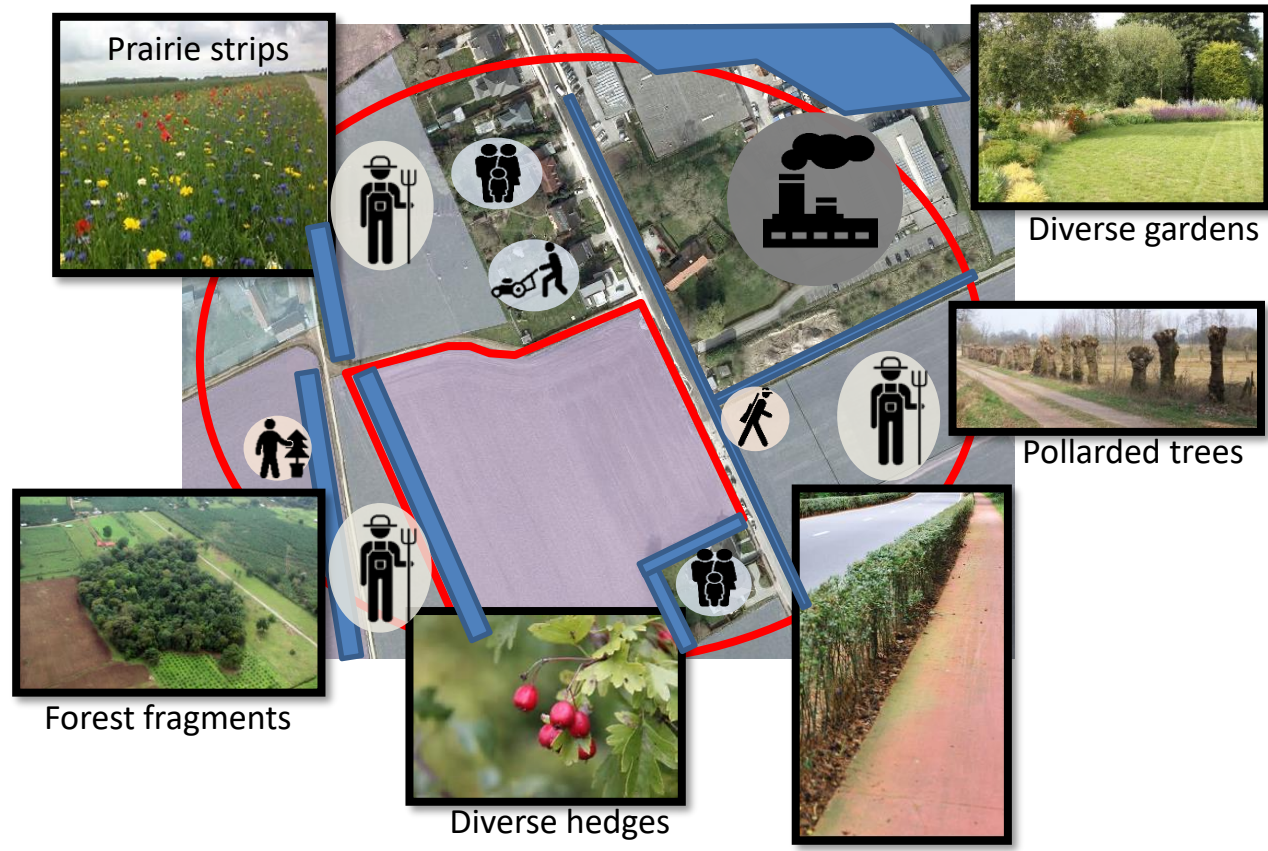
15/11/2022 Bruges



# Content

1. Research context
2. Our citizen science toolbox
3. Spillover effects: transformative learning
4. Take home messages

# Agrobiodiversity at the landscape level

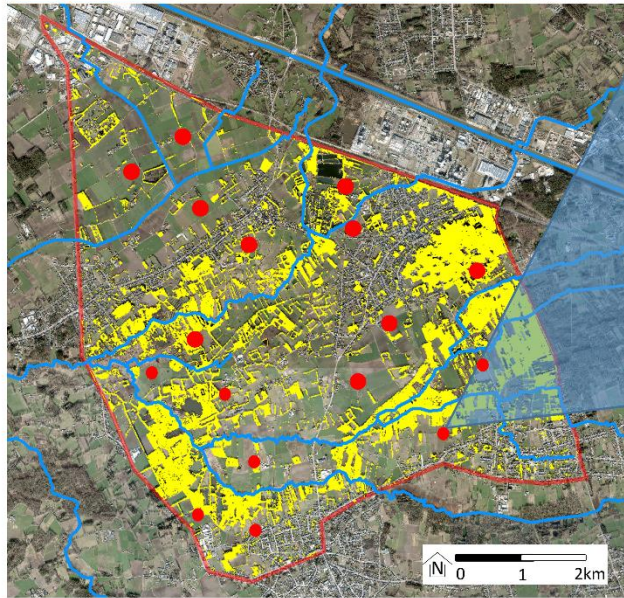
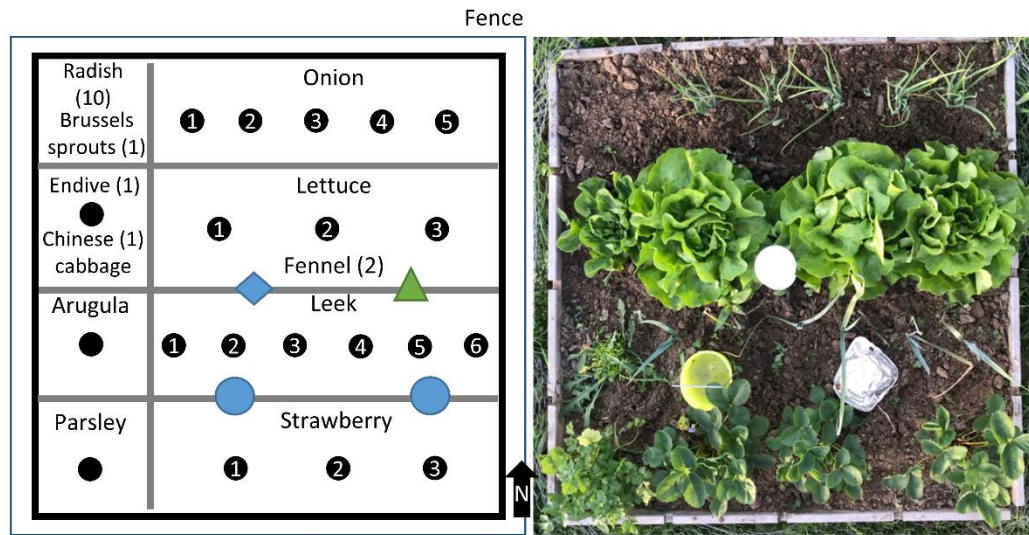


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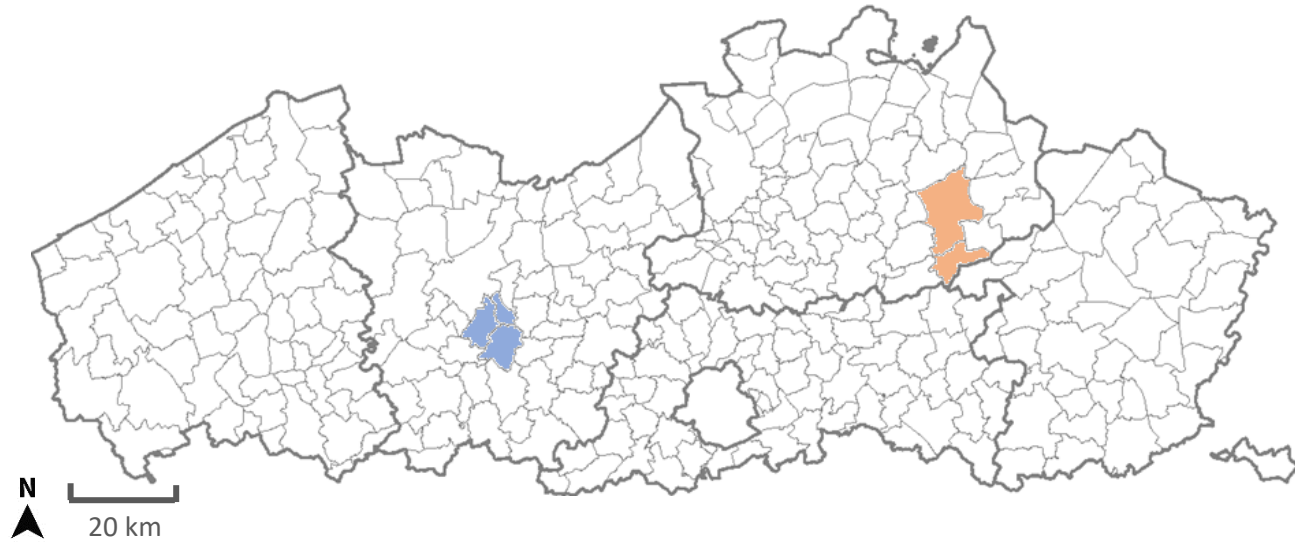
# 1m<sup>2</sup> gardens for citizen science




Gerits et al (2021)



# Two spatially distinct cases



## BEL-Landscape


 2018 & 2019

 Melle, Merelbeke, Oosterzele

 84 volunteers


 40 gardens

## Merode

 2020 & 2021

 Laakdal, Geel

 28 volunteers

 25 gardens

# Unique citizen science project

## Volunteers

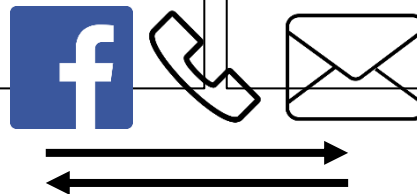
- From May – September (1 visit per week)
  - Watering (5 or 10 liter)
  - Remove weeds
  - Observe invertebrates
  - Harvest procedure
  - Transfer data

## Research team

- Bike/car tour all sites (once every 2 weeks)
  - Insect traps
  - Climate sensors
  - Herbivory assessment
  - General checkup
  - Informal chat



Newsletter (every Wednesday)





# Newsletters

## Newsletter 22: Harvest of leek!

Thursday 19th of September 2019



We can harvest again. In many places the leeks will not be of the large 'store' size, but they will certainly be tasty. Nicely stewed with potatoes, in the soup or in the quiche? Yummy!

Summary for garden visit on September 20 or 21.

### 1. Ten liters of water

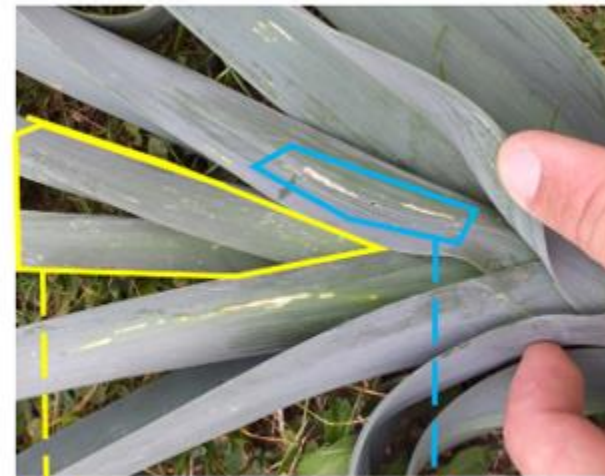
It's been dry for a while. We will not get more than a very local shower for the time being. That is why we again give two green watering cans with a small interval so that the water can infiltrate well.

### 2. Harvest of the leeks

Look further in the newsletter for a detailed step-by-step plan

### 2. Remove the superficial soil from the root base

To make a meaningful measurement, we remove all soil that sticks to the base of the stem (in the photo below we see on the left what we want and on the right a dirty specimen).



Schade door trips (zugplekjes)

Mineerschade (graafgangetjes)

Below again the damage of mining larvae!

# Facebookgroup

25 augustus 2019 · 🌱

Ook in de Rooberg een mooie oogst! 1,6 kg 😊



Jij, [redacted] en 3 anderen

4 opmerkingen Gezien door 32

Leuk

Opmerking plaatsen

Verzenden


Mama spin op pad met de kleintjes in het fornalab tuintje 🕸





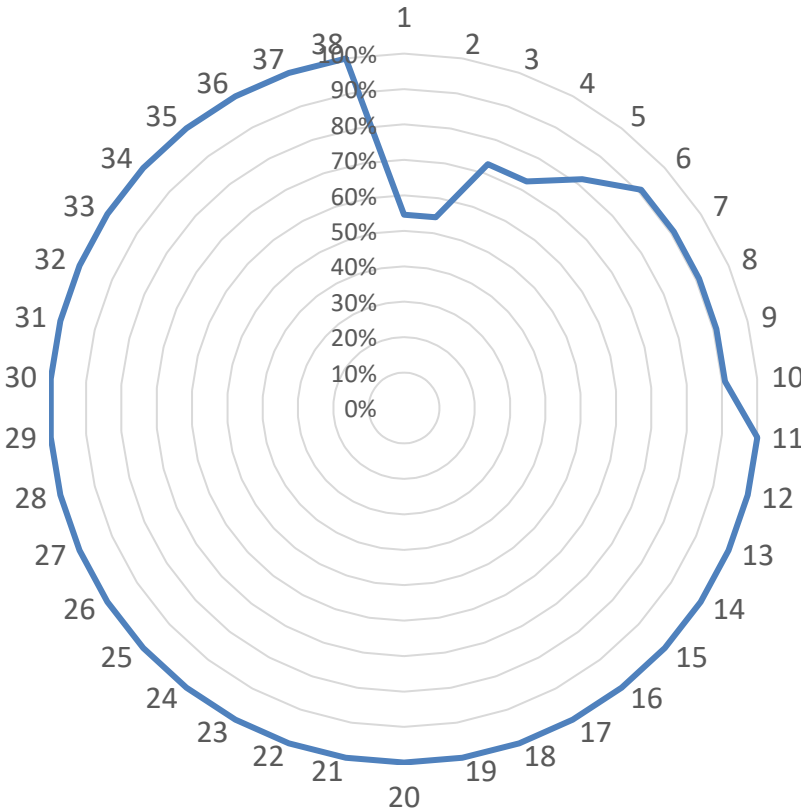
# Frequent informal interactions



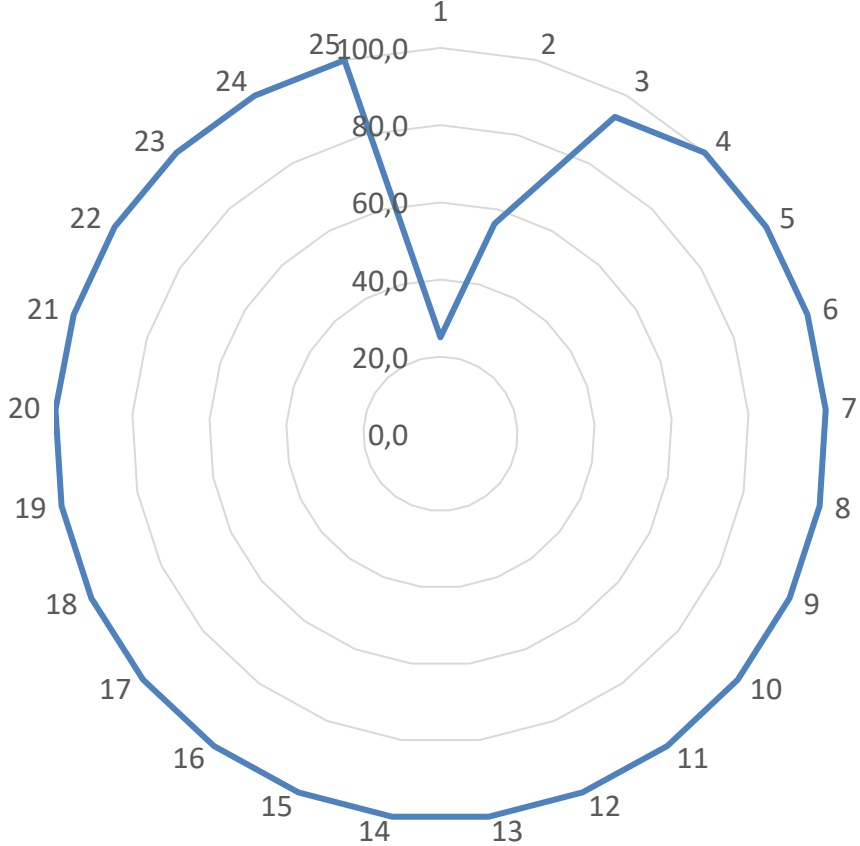
See BEL-Landschap on  YouTube<sup>BE</sup>

# Successful datasets

BEL-Landscape 2019



Merode 2021



# Successful datasets

Strawberry_total	Lettuce_total	Lettuce_average	Endive	Arugula	Parsley	Leek_total	Leek_average	Onion_total	Onion_average	Chinesecabbage	Fennel_total	Fennel_average	BrusselsSprouts_plan	BrusselsSprouts_tota	BrusselsSprouts_average	
34	1070	357	239	153	47	833	143	1648	66	2	0	0	0	0	0	100.0
88	1037	366	372	63	50	2075	346	2027	63	0	343	172	196	8	0	100.0
115	821	274	385	137	80	1868	311	882	35	0	88	44	0	0	0	100.0
373	1085	362	351	133	11	2510	418	1554	54	0	113	57	1012	63	2	100.0
	1346	443	430	177		2408	401						1561	178	4	56.3
405	1117	372	307	130	46	1417	236	1293	42	0	154	77	0	0	0	100.0
312	1317	439	513	161	140	2779	463	1342	52	0	612	306	218	13	1	100.0
250	0	0	188	10	11	1531	255	758	23	0	898	443	0	0	0	100.0
334	342	314	341	63	13	2274	379	1338	54	341	604	302	875	67	2	100.0
424	885	295	273	74	54	1071	173	833	32	34	283	145	166	0	0	100.0
210	534	198	339	173	53	1379	230	554	22	0	0	0	0	0	0	100.0
363	687	223	261	24	38	2553	426	2005	77	995	247	124	961	51	2	100.0
330	1187	396	554	121	38	2837	473	0	0	838	1180	590	3000	500	10	100.0
183	477	153	96	138	17	713	119	747	25	353	220	110	0	0	0	100.0
293	1106	369	274	97	16	1442	240	1126	42	11	261	131	436	14	1	100.0
286	830	295	380	128	55	1936	323	327	13	132	1096	548	516	56	1	100.0
204	825	275	290	175	30	1077	180	1071	32	0	273	140	522	41	1	100.0
200	1244	415	376	155	53	2418	403	1334	53	325	176	88	376	23	1	100.0
423	327	109	283	135		2107	351	1653	66	555	368	184	530	200	14	33.8
	1031	364	441	232												25.0
366	334	311	231	113	39	1384	231	933	41	104	210	105	0	0	0	100.0
344	1233	411	350	29	100	2301	384	1851	64	166	632	316	1208	61	1	100.0
542	852	284	253	152	62	1660	277	1113	37	12	230	145	181	0	0	100.0
404	1323	441	437	121	44	515	86	1114	40	403	765	383	0	0	0	100.0
383	729	243	307	66	75	1200	200	538	27	0	672	336	500	13	1	100.0

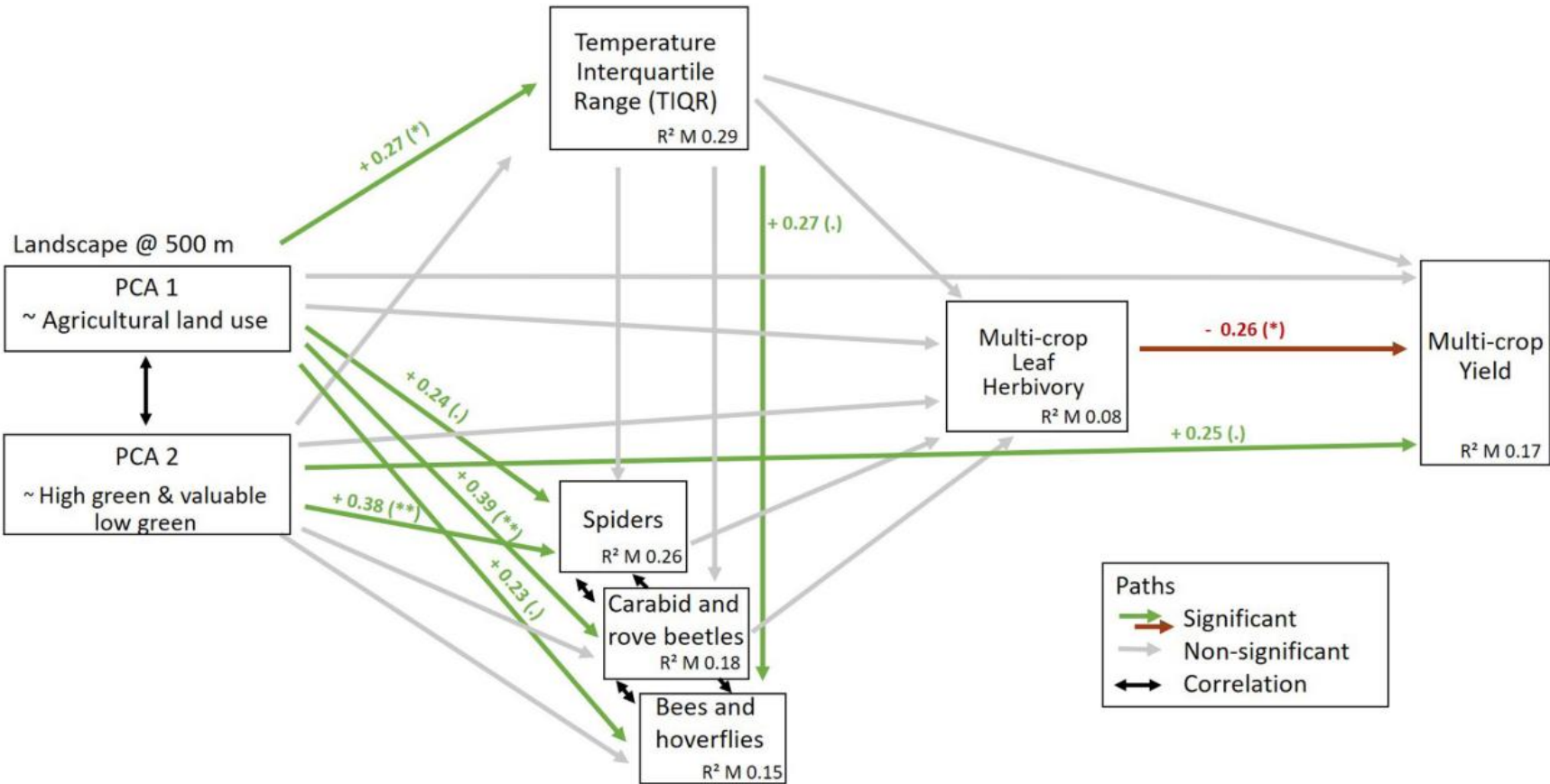
MULTI-CROP index



$$MCH_{FAB-Garden} = \sum_{i=1}^F (\text{herbivory}_i > t_i),$$



# Successful datasets

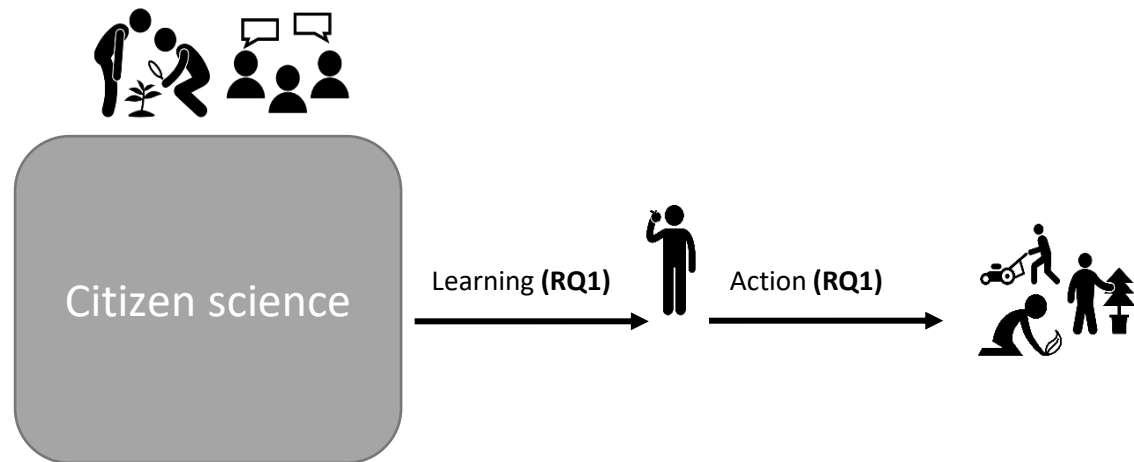


Gerits et al (2022, 2023)

# Content

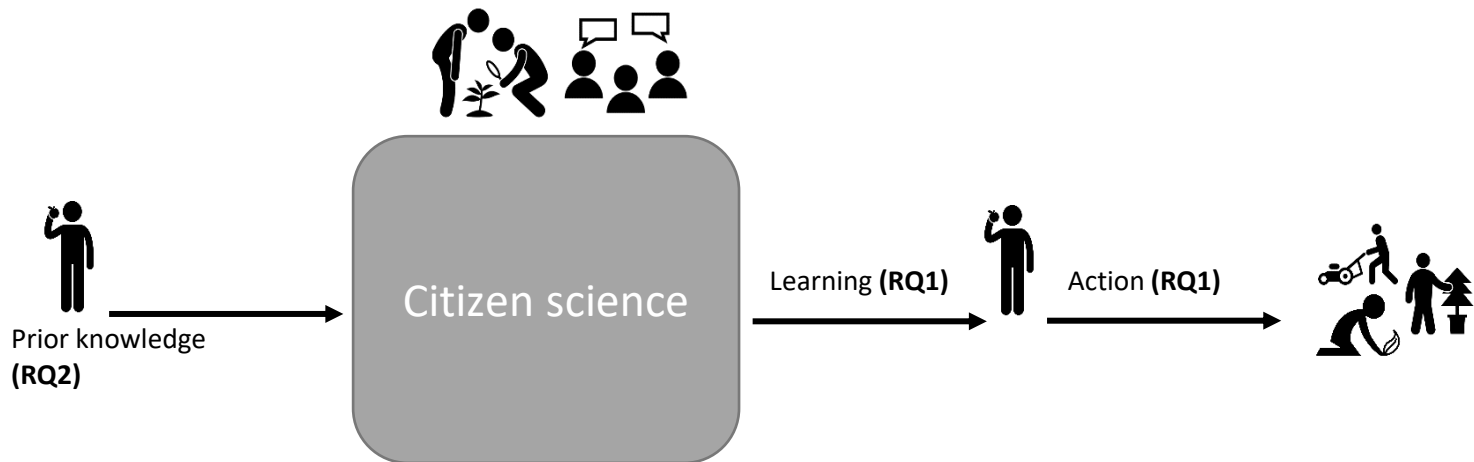
1. Research context
2. Our citizen science toolbox
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# Back to the social side of the system: Research questions



RQ1: Learned, changed, transformed?

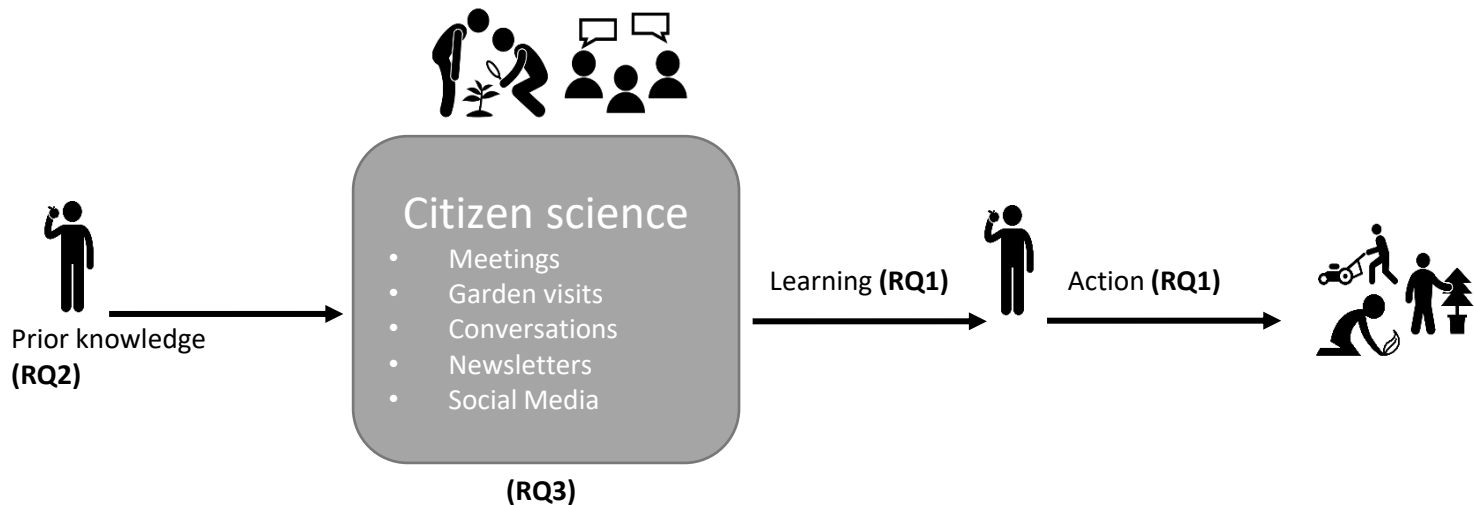
# Research questions



RQ1: Learned, changed, transformed?

RQ2: Importance of prior knowledge

# Research questions



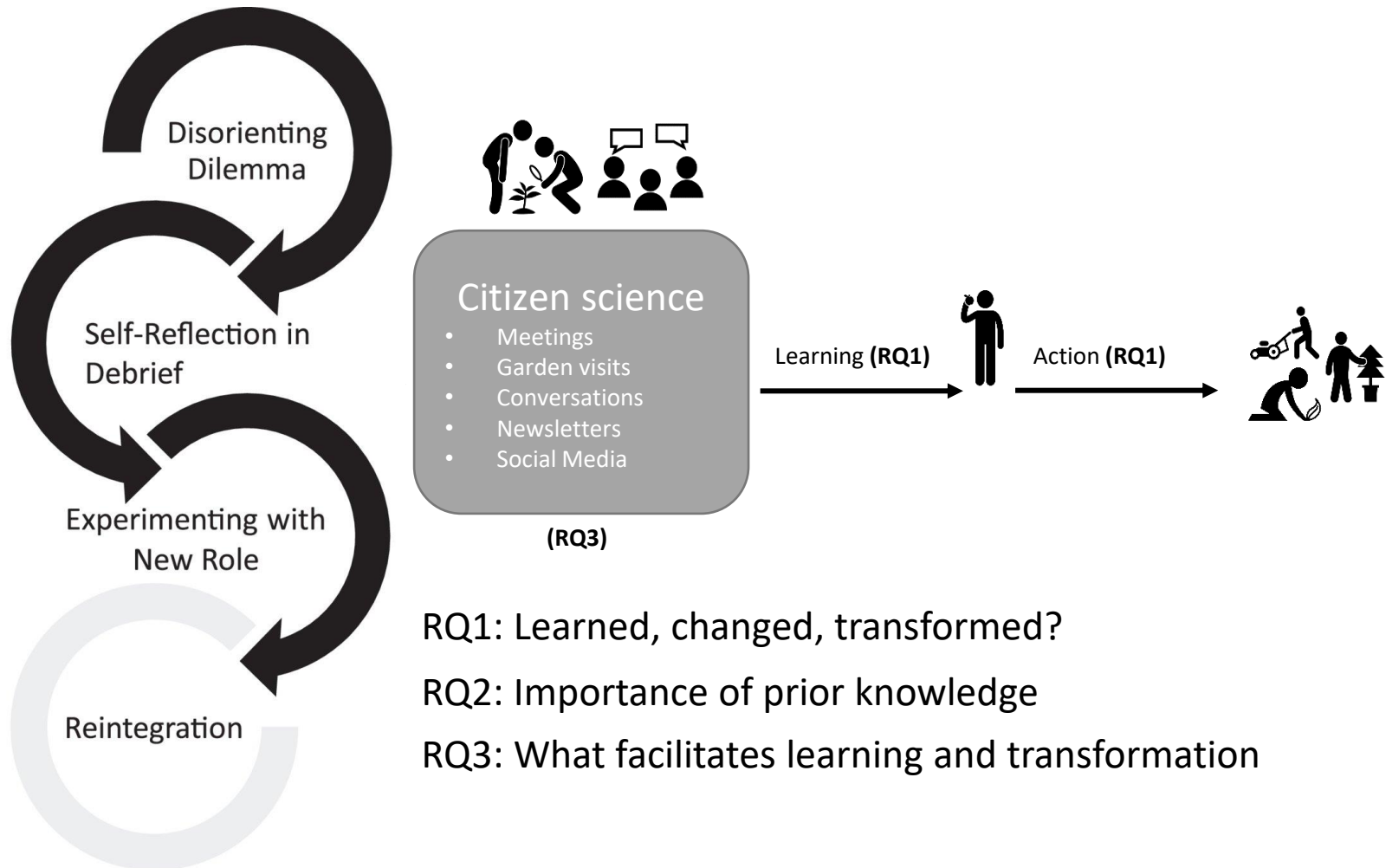
RQ1: Learned, changed, transformed?

RQ2: Importance of prior knowledge

RQ3: What facilitates learning and transformation



# Research questions



RQ1: Learned, changed, transformed?

RQ2: Importance of prior knowledge

RQ3: What facilitates learning and transformation

Using theory of transformative learning (Mezirow 1970)

# Time to survey

- Post-project survey
  - Quantitative data (select options)
  - Qualitative data (open questions)



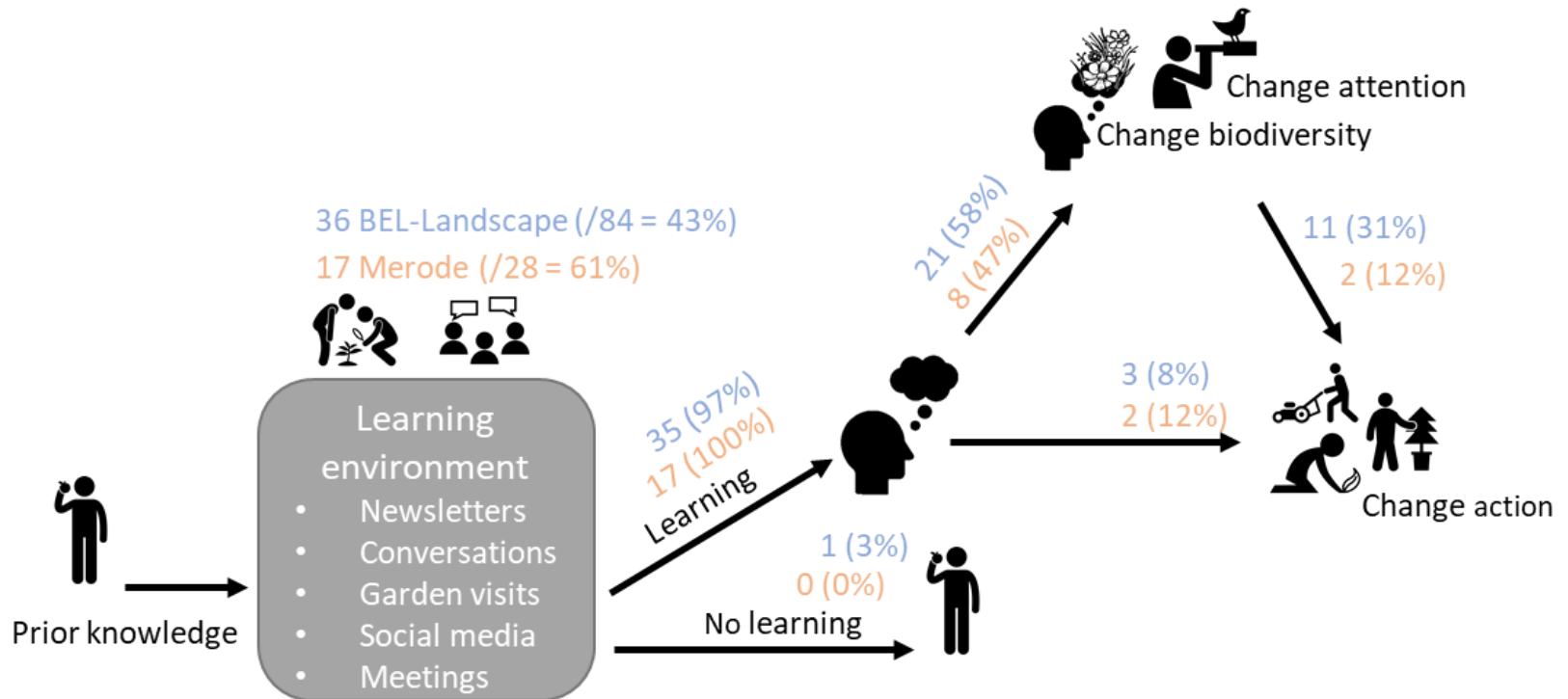
Wat heeft u geleerd? En in tweede instantie, waaruit heeft u dat vooral geleerd?  
Gelieve rustig de tijd te nemen om na te denken en te antwoorden in volzinnen.

Selecteer waaruit u dit voornamelijk heeft geleerd (meerdere zijn mogelijk)

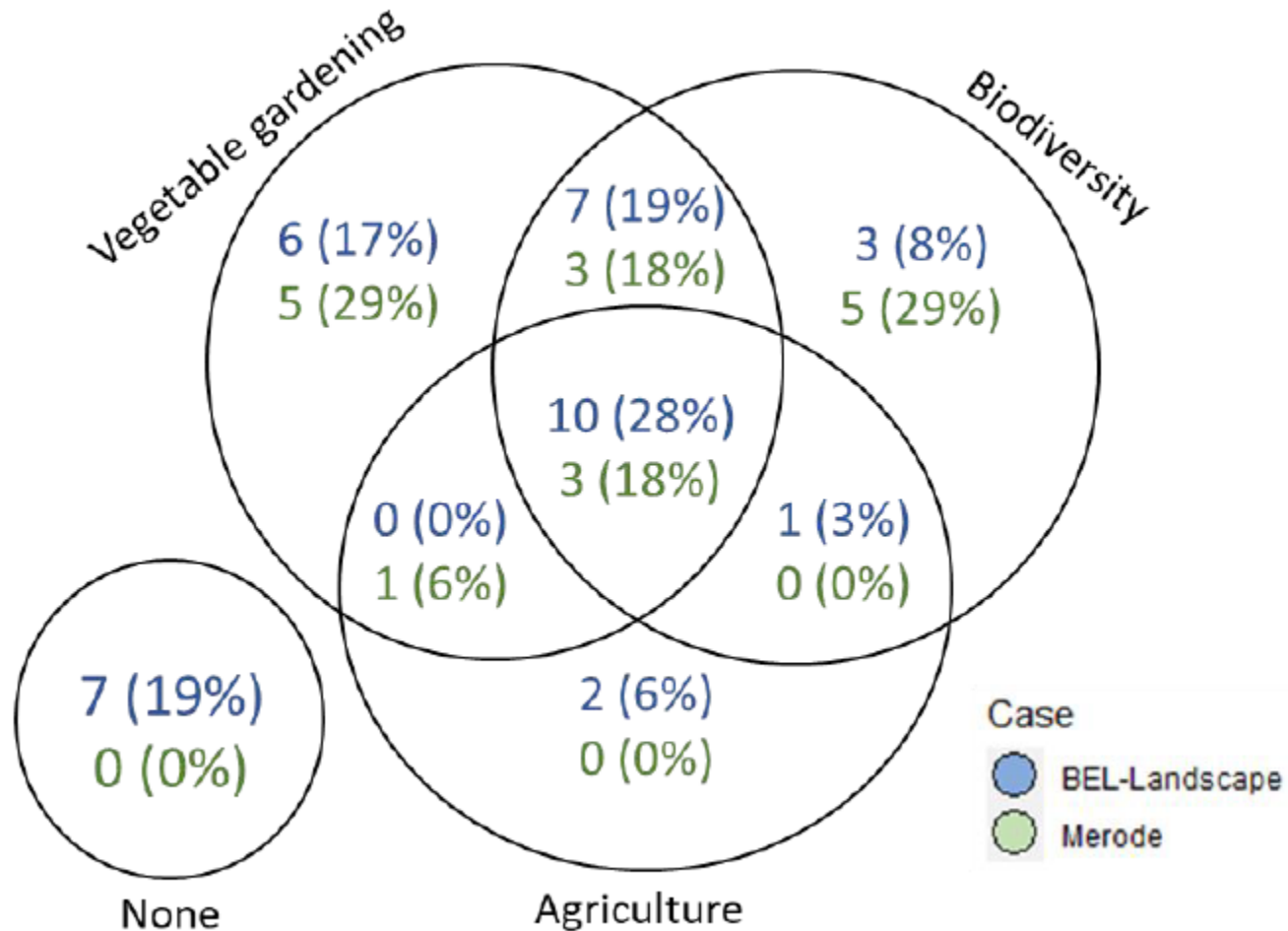
Nieuwsbrieven   Facebook   Gesprek met tuiniers   Gesprek met onderzoekers   Internet   Insectenlijst   Onkruidlijst   Bijeenkomsten   Zelf observeren

Over moestuinieren

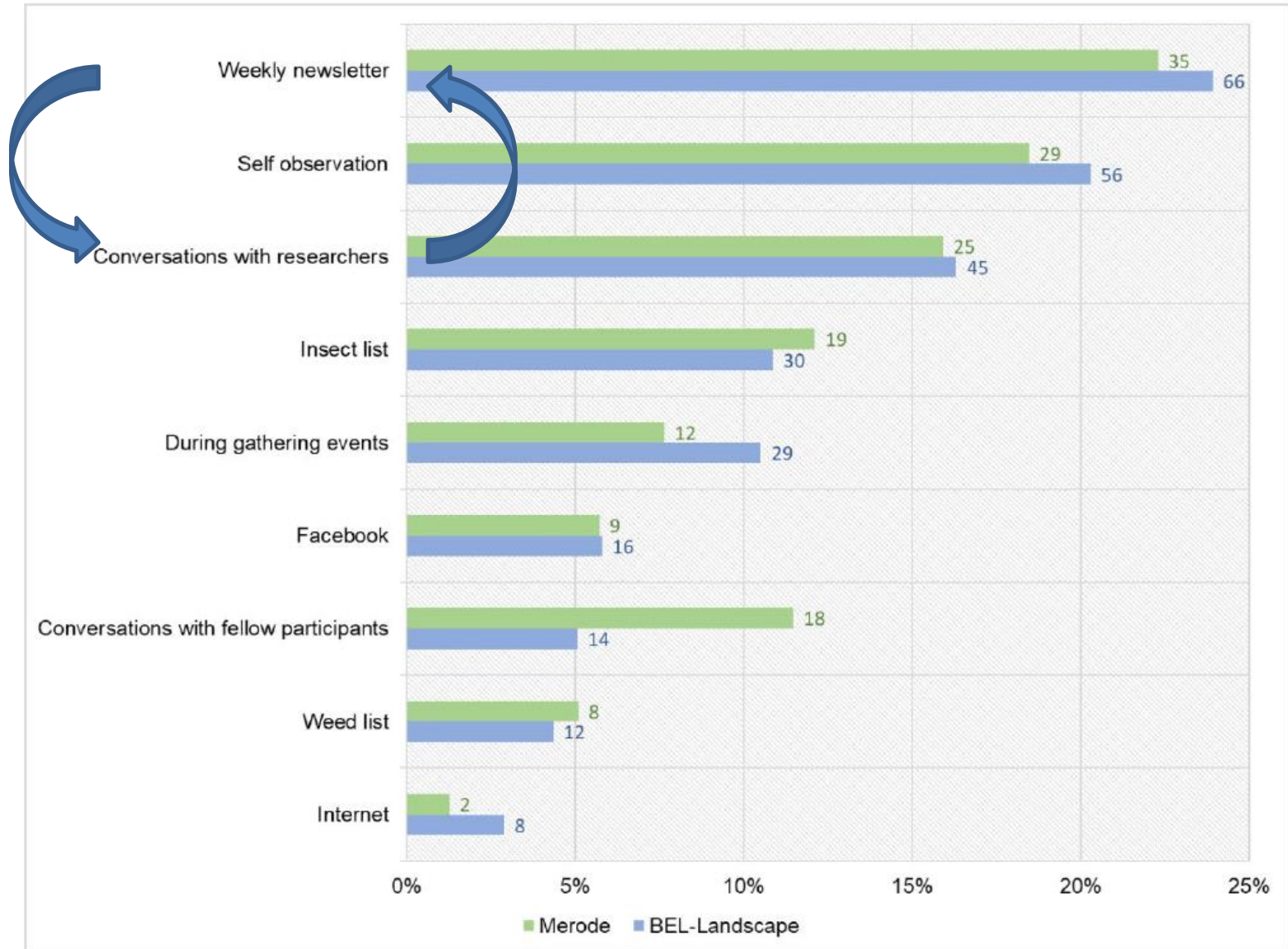
# Survey results



# Survey results



# Combine newsletter, tactile tool and informal talks





# Take home messages

- Frequent communication AND informal interactions
- Combine a tactile tool with written communication
- Be aware of prior-knowledge: use it
- Show mutual enthusiasm and dedication of both the research team AND the citizen scientists 😊
- This will BOTH increase motivation AND transformative learning
- Take home: Citizen science = more than only data, learning of participatns is also valuable.

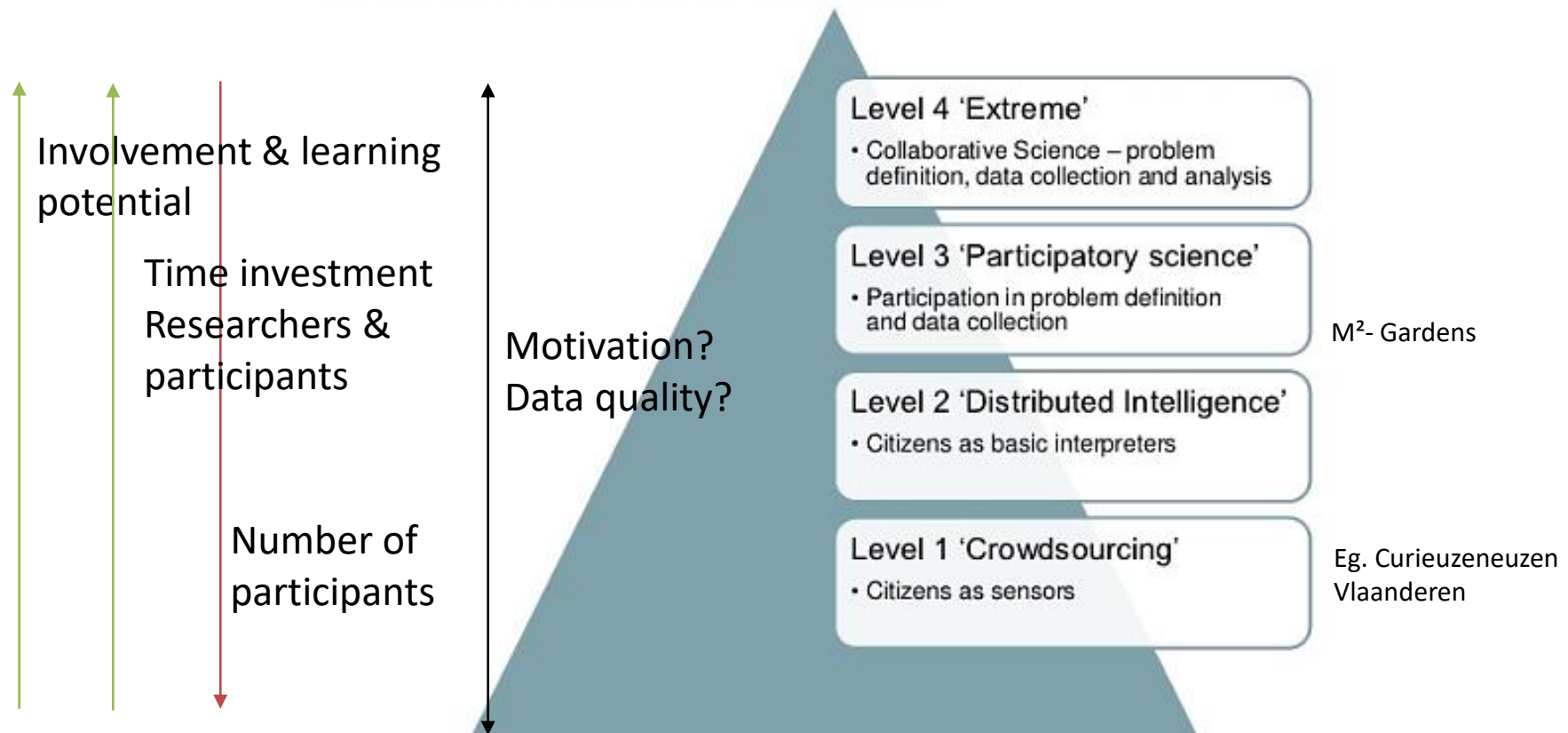
# Thank you!



*"I hear and I forget, I see and I remember, I do and I understand." (Gentry, 1990)*

# What type of citizen science

## Levels of Citizen Science



# Succesful datasets



Inloggen

FABulous Farmers - De Merode > De Merode > Opvolging tuintjes

ALLES DOWNLOADEN



Mappen

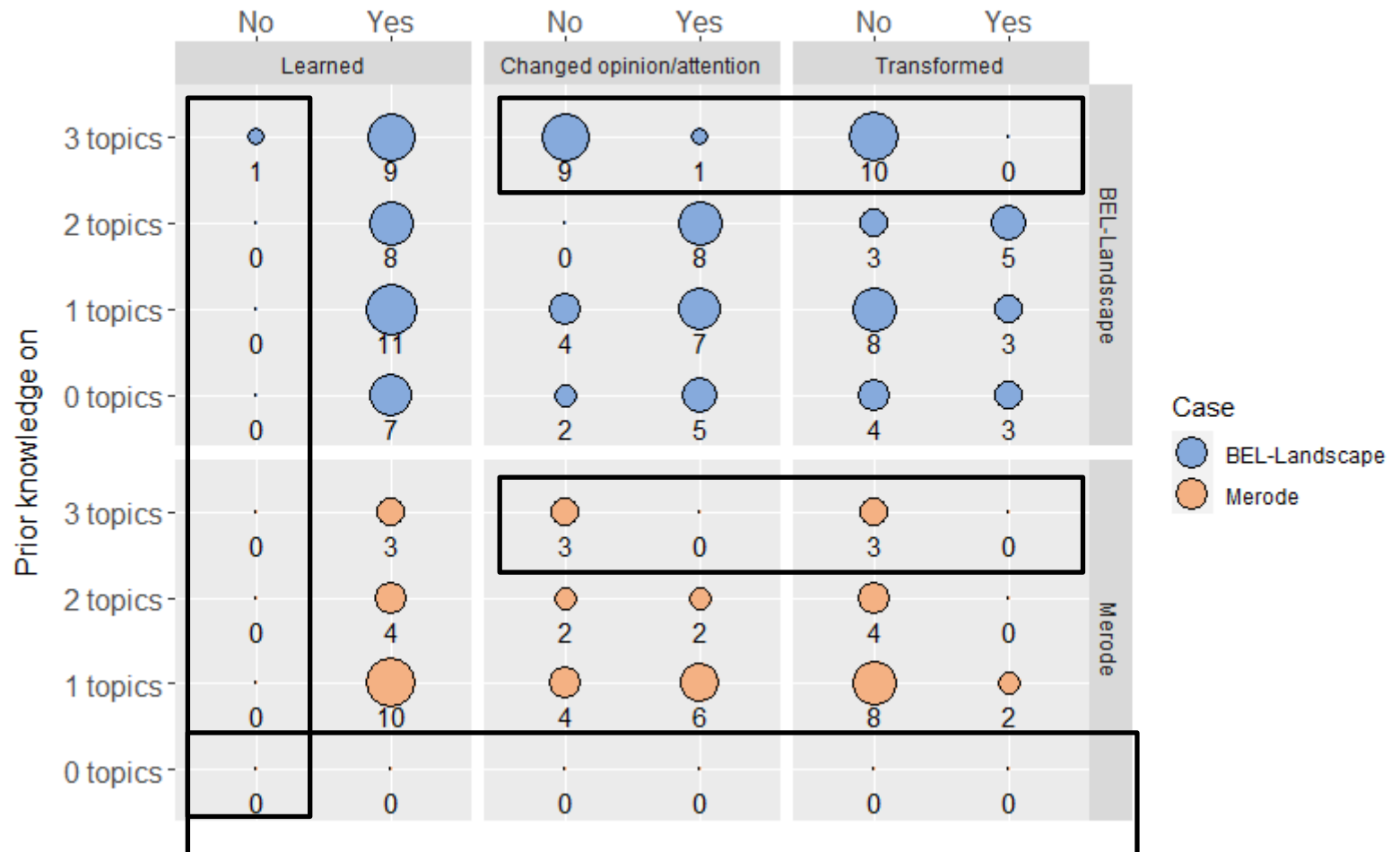
Naam ↑

- 1 & 2 Gemeentehuis L...
- 3 Pastorijtuin
- 4 Veldstraat
- 5 De Lommerte
- 6 Diestse Baan
- 7 Kruisstraat
- 8 Hulstsestraat
- 9 Warandepad
- 10 Vorstsebaan
- 11 Steenbergenveld
- 12 Watereinde
- 13 Blaardonk
- 14 Trichelhoek
- 15 & 16 Samentuin
- 17 Zammelseweg - 176
- 18 Zammelseweg - 12
- 19 Kalvariebergstraat
- 20 Heikantstraat
- 21 Steenweg op Meerh...
- 22 Kapelleberg
- 23 Bergstraat
- 24 Heustenstraat
- 25 Oude Vorstseweg

Bestanden

- Onkruid herkennen voor dummys**  
PDF (on)kruiden
- Deelnemerslogboek**  
X
- Draaiboek voor tuiners**  
W DraaiboekTuintjes.docx
- Veelvoorkomende inse...**  
PDF

# Prior knowledge ~ transformation





# Learn, reflect, transform

Example from the BEL-Landscape case

