

The value of  
Topsector  
research for  
horticulture and  
society

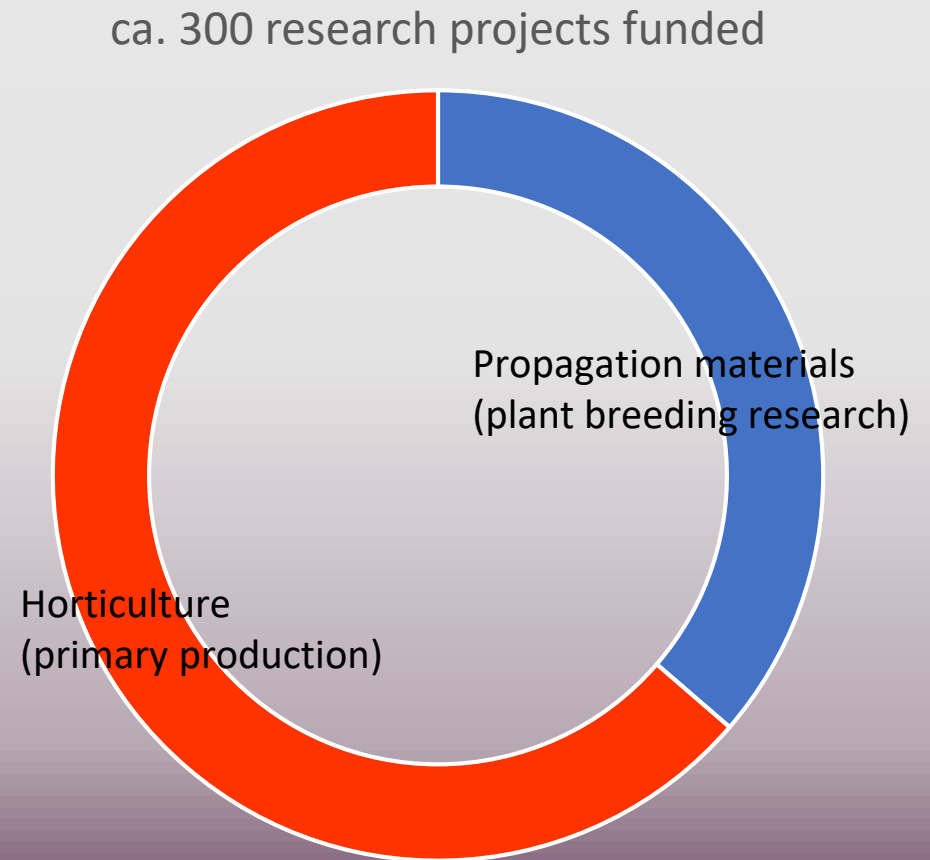
Clemens Stolk &  
Stefan de Jong

# Research with impact

# Topsector Horticulture & Propagation Materials

- Topsector policy announced in 2011
- Annual calls for for research proposals as of 2012
- Now 300 research projects funded
- Typical project size €0.5 M
- Funding: 50% public, 50% private

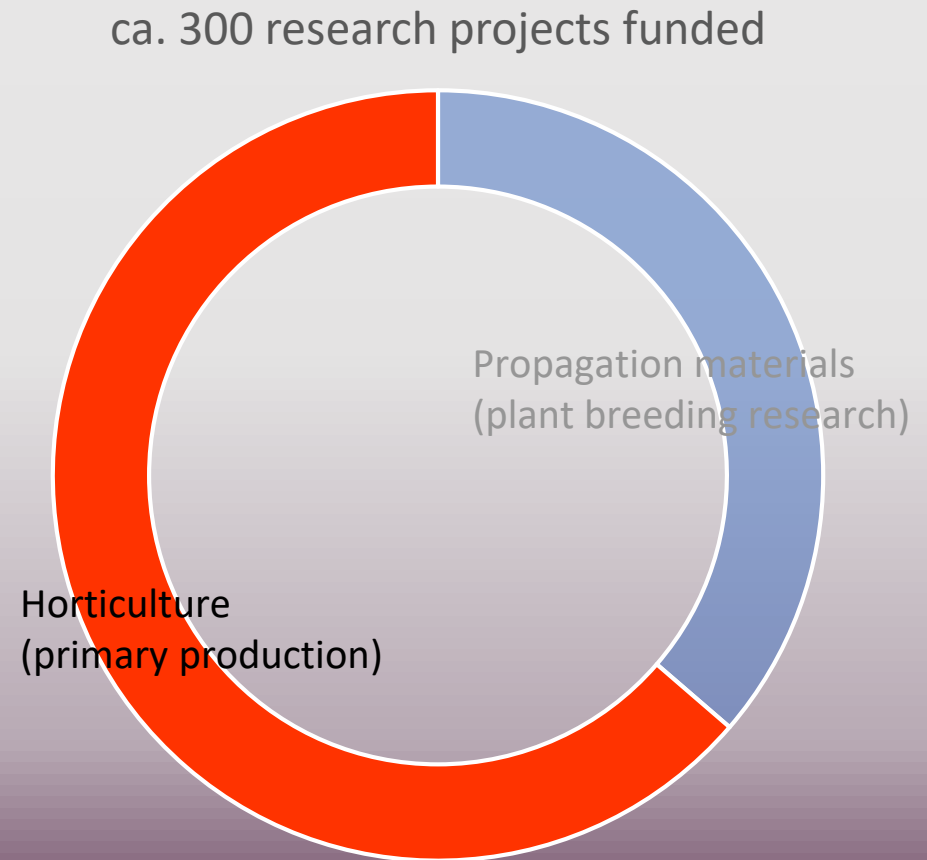
*What has this delivered us so far?*



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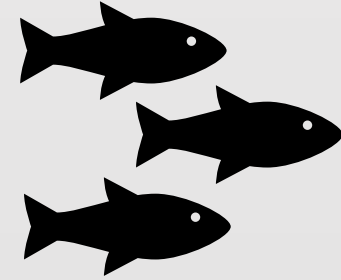
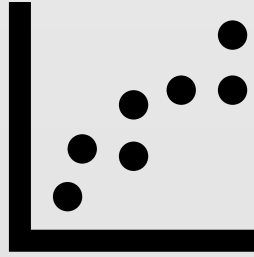


Activities

Output

Outcomes

Impact



Research on water quality in greenhouse cultivation

Insights in how greenhouse operators can decrease discharges of recirculation water without production losses

Water Council writes publication with practical advice, aimed at greenhouse operators.

Greenhouse operators adopt new strategy and reduce discharges.

Ecological water quality in the region improves.

Vulnerable species increase in numbers.

Fewer intake stops of drinking water companies.

Activities

Output

Outcomes

Impact

Network

**EXAMPLE: Follow up projects.**  
How many? With same partners, new partners, or combination of both?

Economy

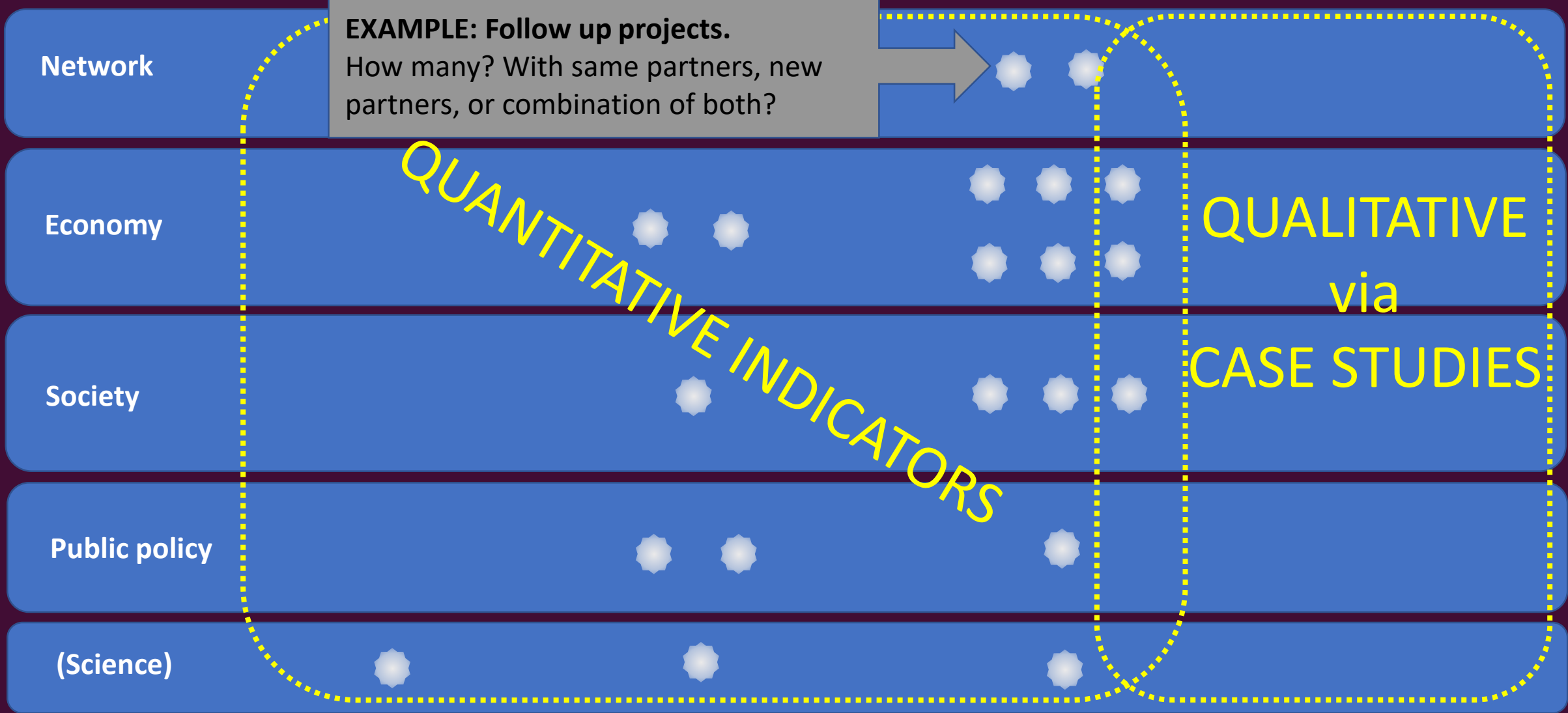
Society

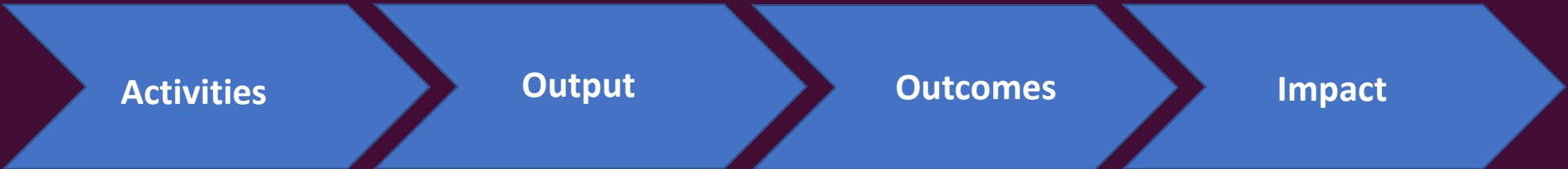
Public policy

(Science)

QUANTITATIVE INDICATORS

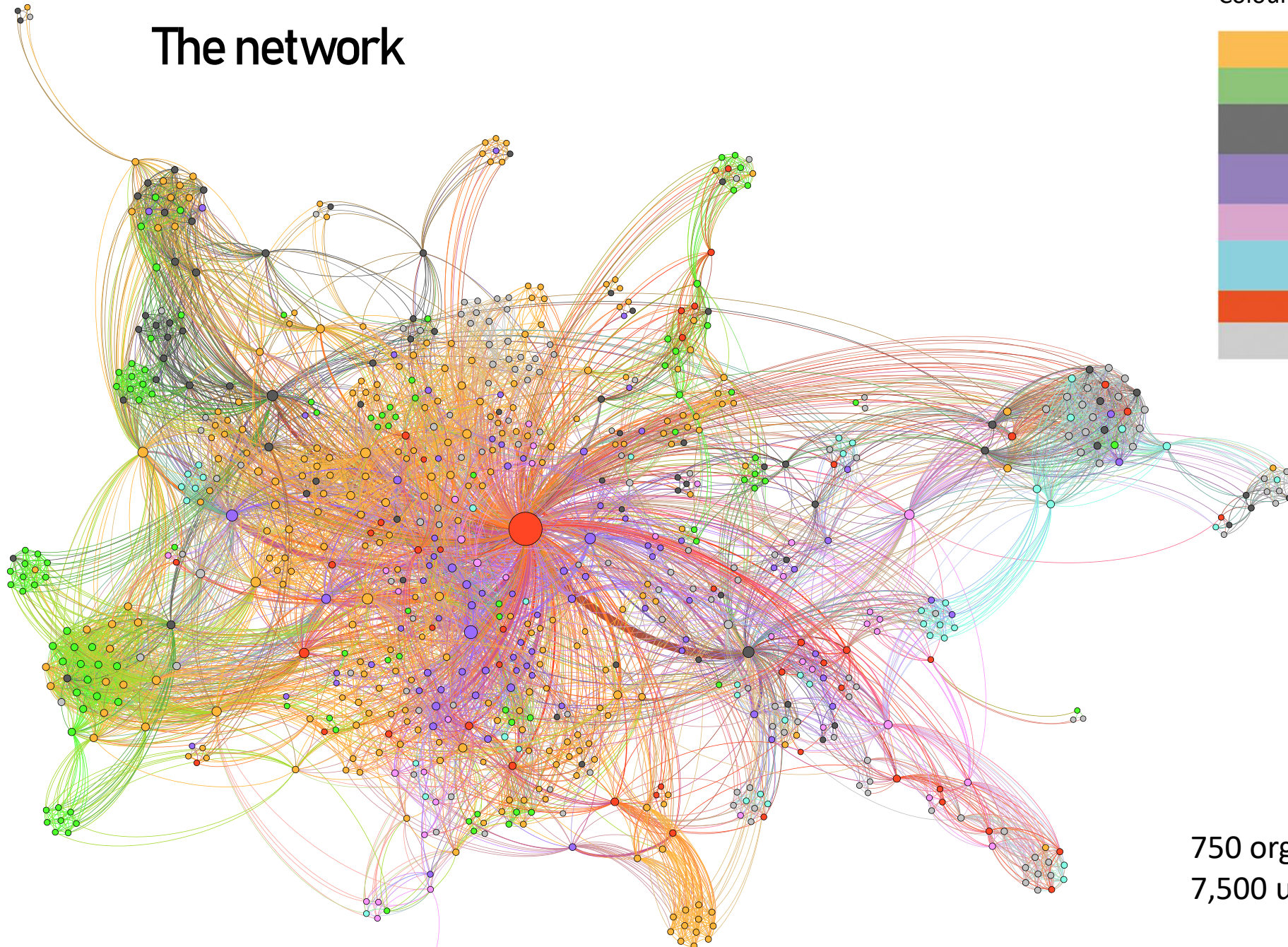
QUALITATIVE  
via  
CASE STUDIES





	Activities	Output	Outcomes	Impact
Network	● ●	●	● ●	
Economy		● ●	● ● ● ● ● ●	
Society		●	● ● ●	
Public policy		● ●	●	
(Science)	●	●	●	

# The network

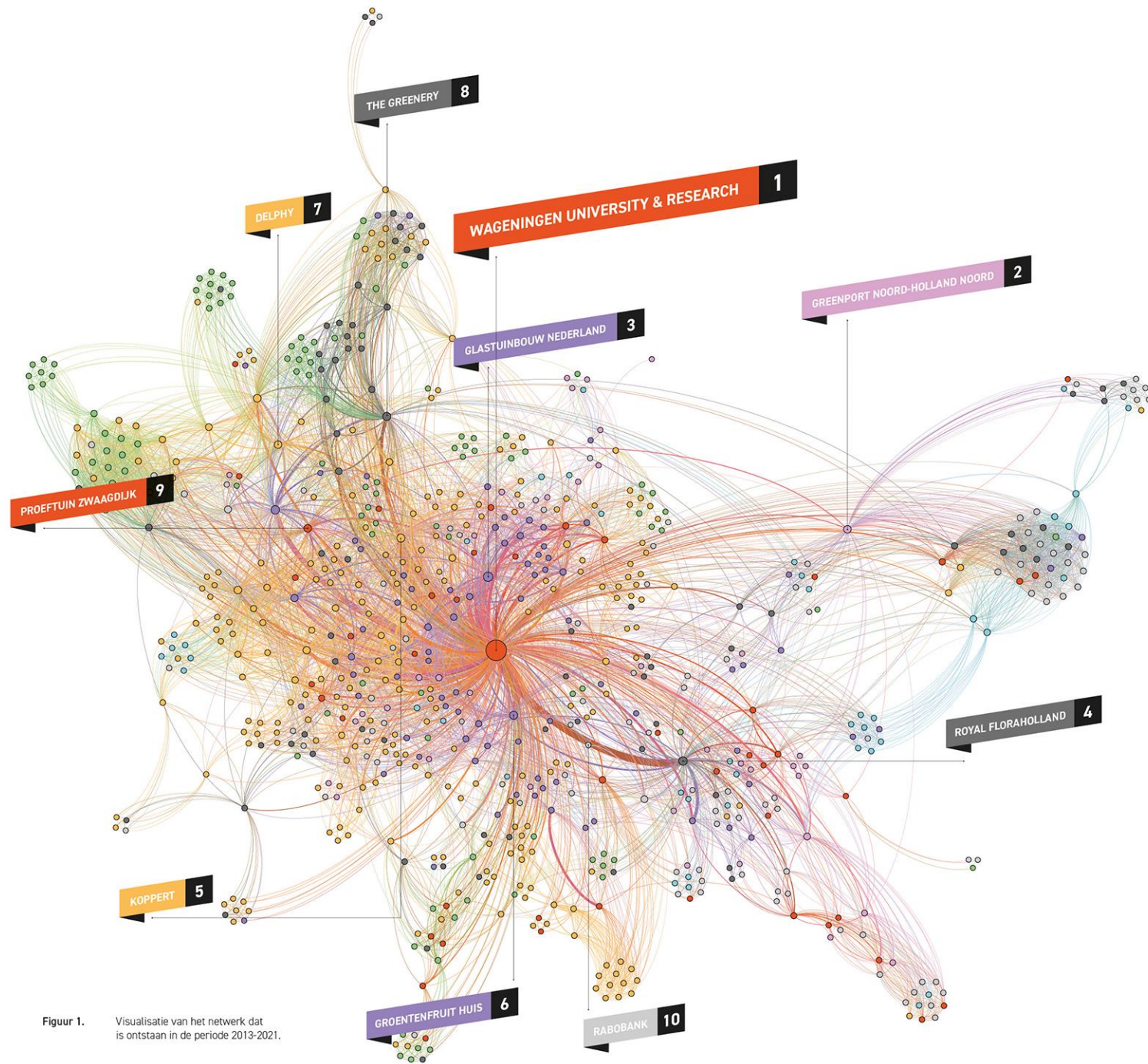


Colour	Type of organisation	Percentage of the network
Orange	Suppliers	34
Green	Primary producers	14
Dark Grey	Companies active in trade and/or processing	10
Purple	Trade associations	11
Pink	Public-private organisations	5
Light Blue	Public organisations (other than knowledge institutes)	6
Red	Knowledge institutes	6
Grey	Other	14
	Total	100

750 organisations  
7,500 unique relationships



# HET NETWERK 2021



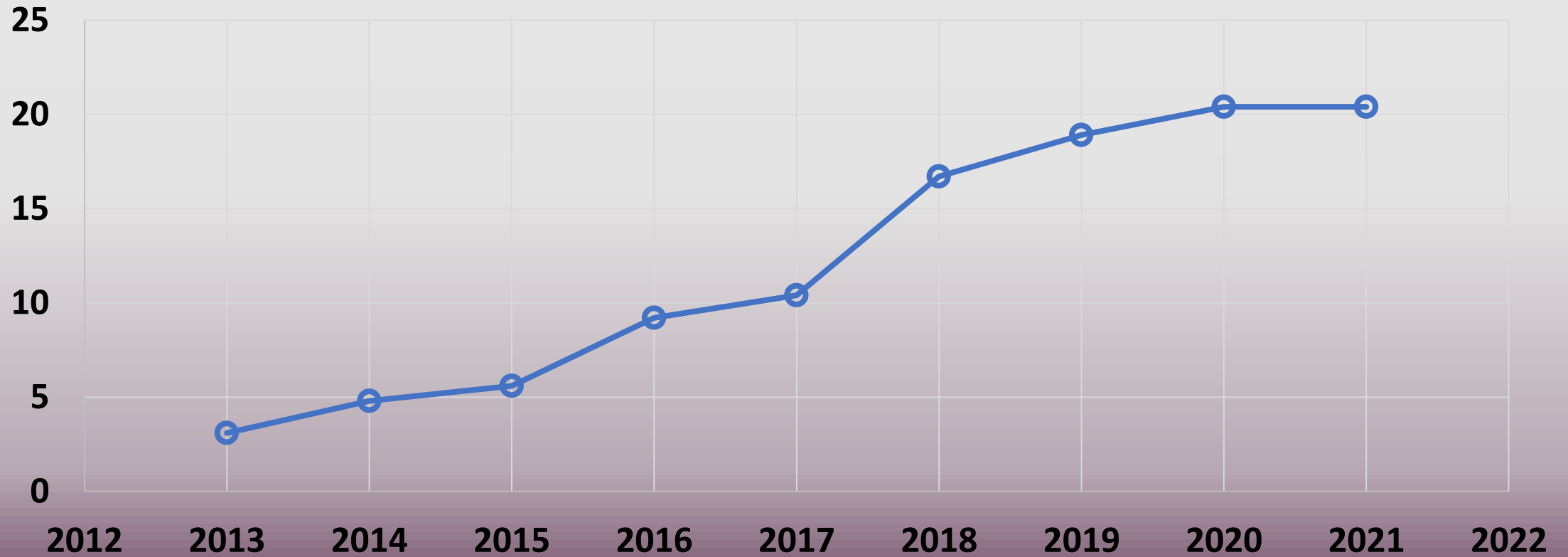
Figuur 1. Visualisatie van het netwerk dat is ontstaan in de periode 2013-2021.

Kleur	Type organisatie	Percentage van het netwerk
Orange	Toeleveranciers	34
Green	Primair producenten	14
Grey	Ondernemingen actief in handel en/of verwerking van tuinbouwproducten	10
Dark Purple	Brancheorganisaties (incl. gewascoöperaties)	11
Pink	Publiek-private organisaties	5
Light Blue	Publieke organisaties (anders dan kennisinstellingen)	6
Red	Kennisinstellingen	6
Grey	Overig	14
	Totaal	100



# Metrics of the network

*Average number of organisations with which an organisation is connected*

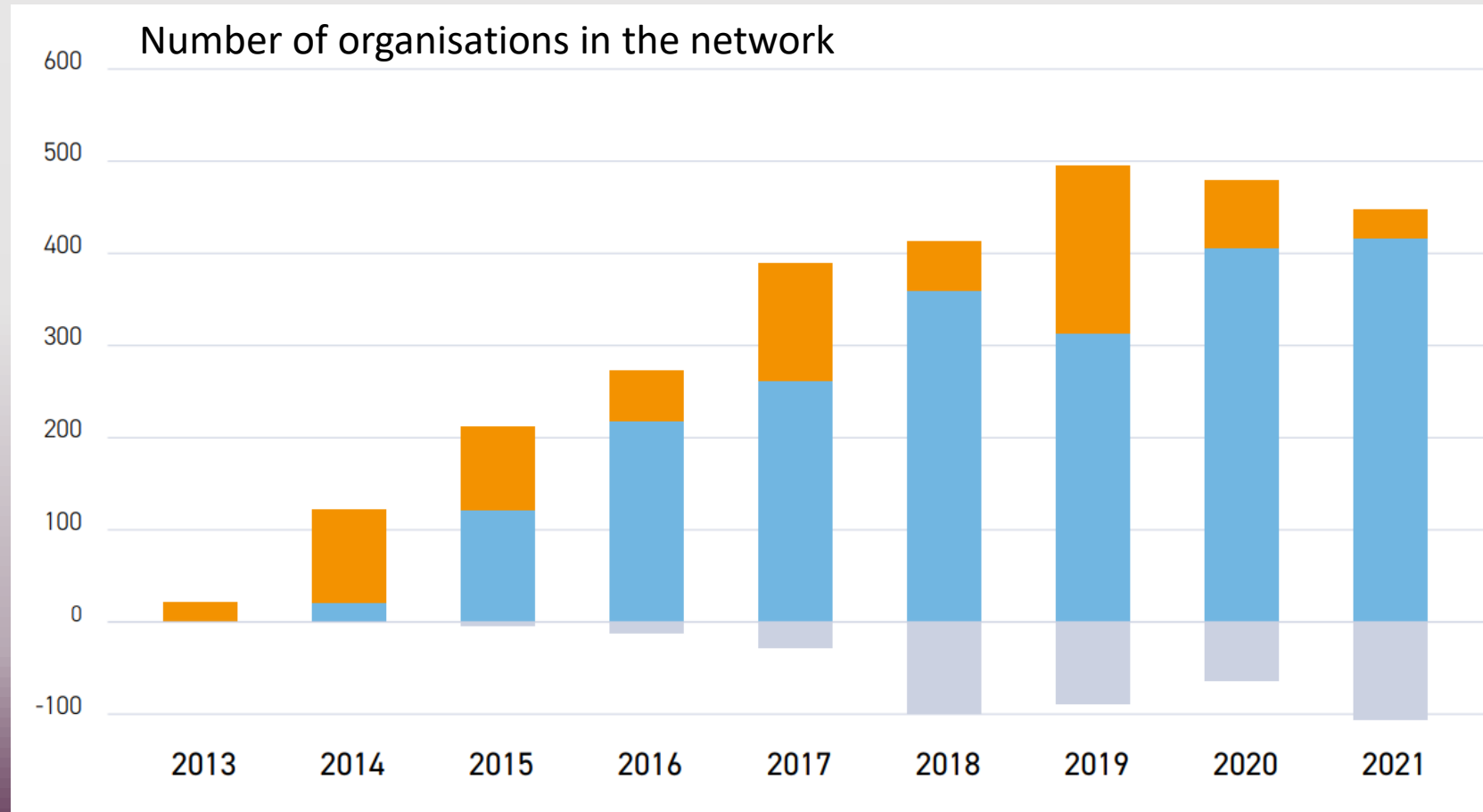


# The network contains a 'stable core'...

7	2013	2014	2015	2016	2017	2018	2019	2020	2021
1	Wageningen Research	Wageningen Research	Wageningen Research	Wageningen Research	Wageningen Research	Wageningen Research	Wageningen Research	Wageningen Research	Wageningen Research
2	Delphy	BASF	Greenport NHH	The Greenery	Glastuinbouw Nederland	Glastuinbouw Nederland	Glastuinbouw Nederland	Glastuinbouw Nederland	Industrial Product Sol.
3	Proeftuin Zwaagdijk	Delphy	Delphy	Greenport NHH	The Greenery	The Greenery	Greenport NHH	Industrial Product Sol.	Koppert
4	NFO	FloraHolland	FloraHolland	Glastuinbouw Nederland	Greenport NHH	Greenport NHH	Botman Hydroponics	Koppert	Glastuinbouw Nederland
5	BASF	Greenport NHH	BASF	FloraHolland	FloraHolland	FloraHolland	Rabobank	Stichting de Groene Stad	Stichting de Groene Stad
6	Fruitconsult	NFO	Proeftuin Zwaagdijk	GroentenFruit Huis	GroentenFruit Huis	GroentenFruit Huis	FloraHolland	GroentenFruit Huis	Rabobank
7	Productschap Tuibouw	Koninklijke Vezet	Koppert	Delphy	Proeftuin Zwaagdijk	Rabobank	LTO Nederland	Rabobank	LTO Nederland
8	LTO Groei-service	Homburg Machinehand.	Universiteit Leiden	VGB	Stichting iVerde	NFO	GroentenFruit Huis	Van Kempen Koudetechn.	HAS Hogeschool
9	Agroplant	Universiteit Leiden	Homburg Machinehand.	Stichting iVerde	VGB	Koppert BV	The Greenery	LTO Nederland	Greenport NHH
10	Fobek	FOBU Ingredients	NFO	Proeftuin Zwaagdijk	Delphy	LTO Nederland	Dümmen Orange	Proeftuin Zwaagdijk	Proeftuin Zwaagdijk

Top-10 organisations according to 'betweenness centrality'

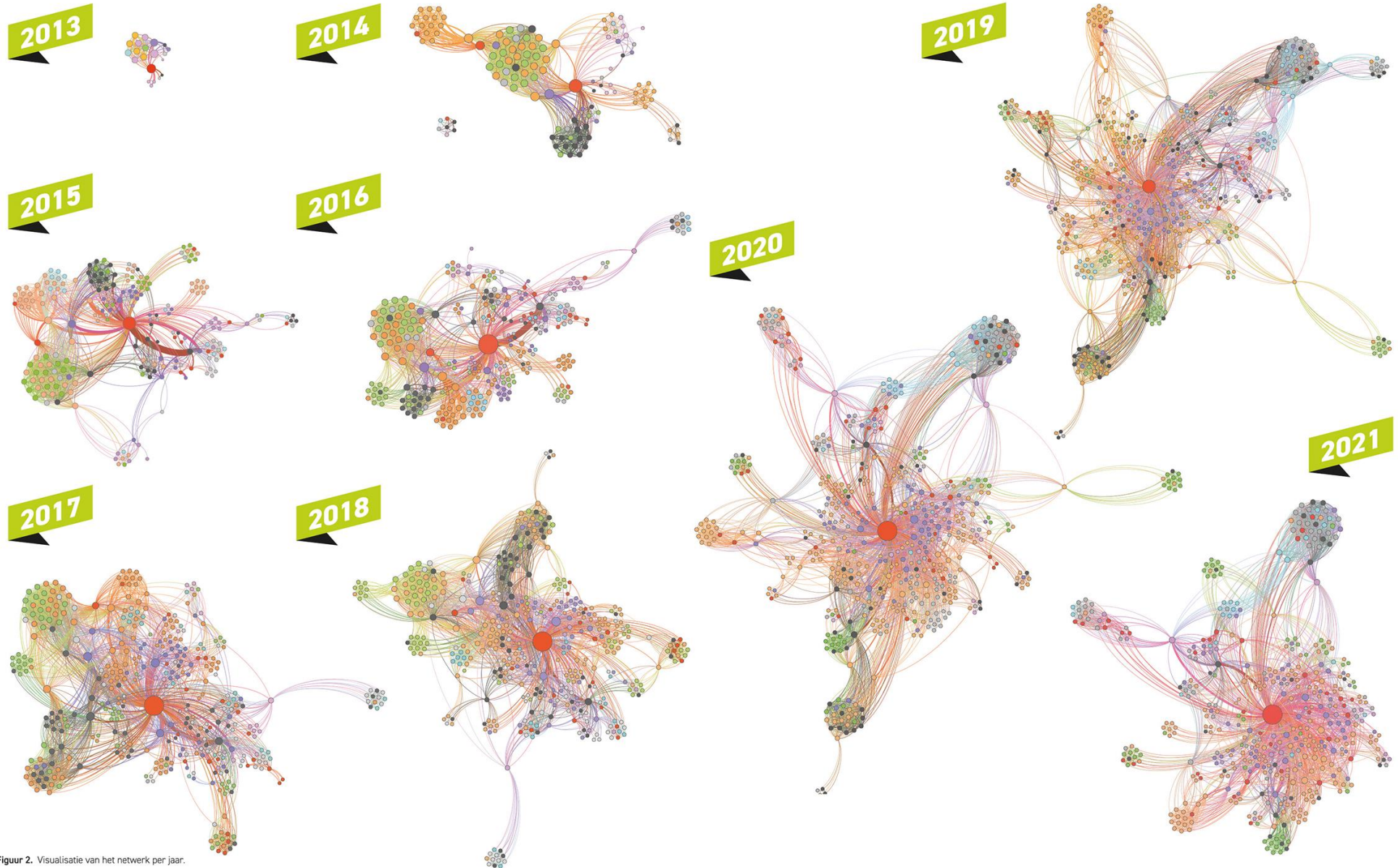
# ... and shows renewal in the periphery



2016-2021: on average  
~20% new entrants into  
the network per year



The network ...

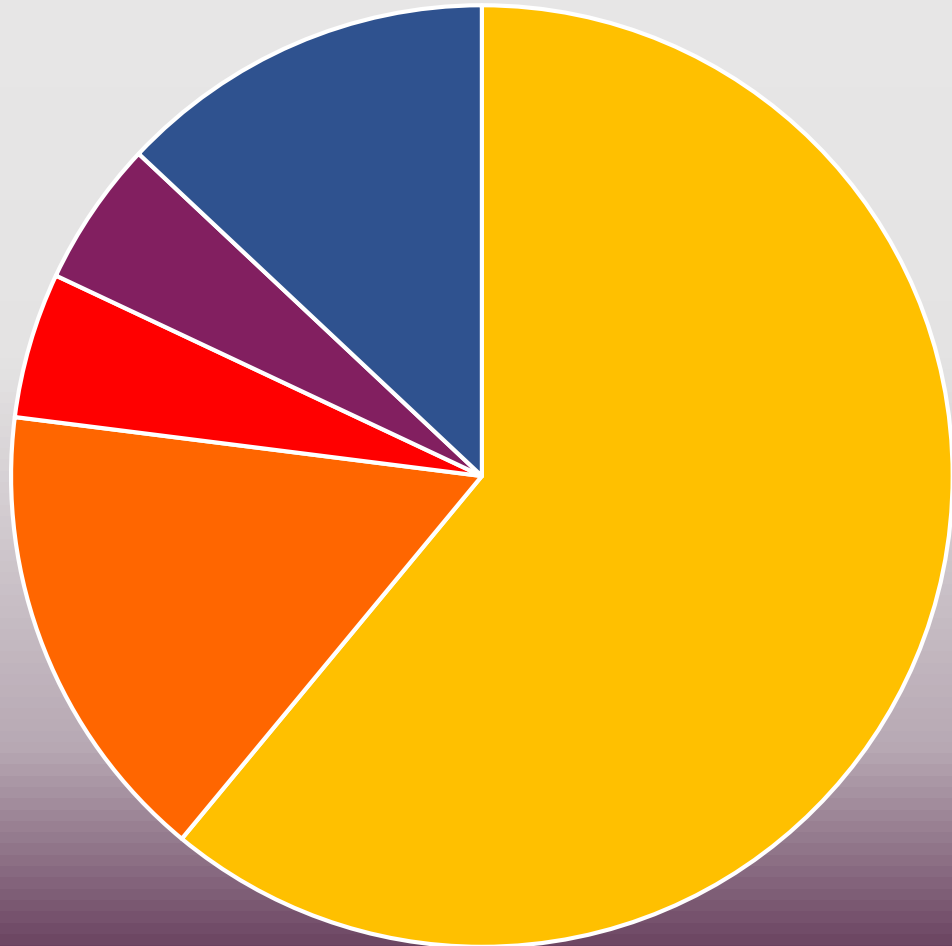


Figuur 2. Visualisatie van het netwerk per jaar.

... is increasingly conducive to innovation

# Consortia are stable, grow, and give rise to follow up projects

The **89** completed projects so far gave rise to **145** follow up projects



- With part of the consortium
- With part of the consortium + new partners
- With completely new partners
- With the same consortium + new partners
- With same consortium



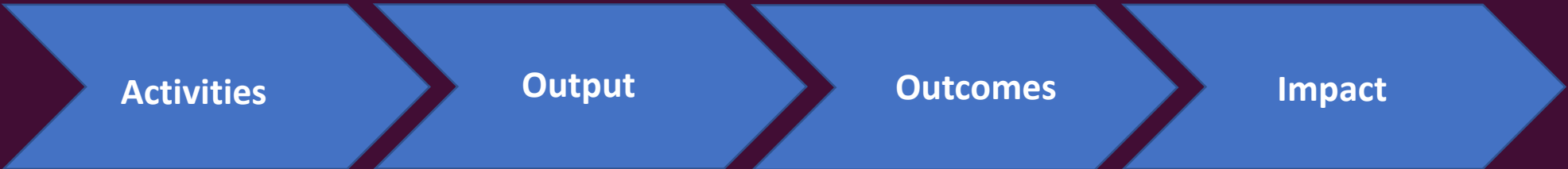
## Quotes from one of the interviews

“I wanted to see for myself how these Topsector projects work, and I wanted my network to grow.”

“Now I have seen how things work, I have signed up to two new Topsector proposals in the last call!”

Charl Goossens

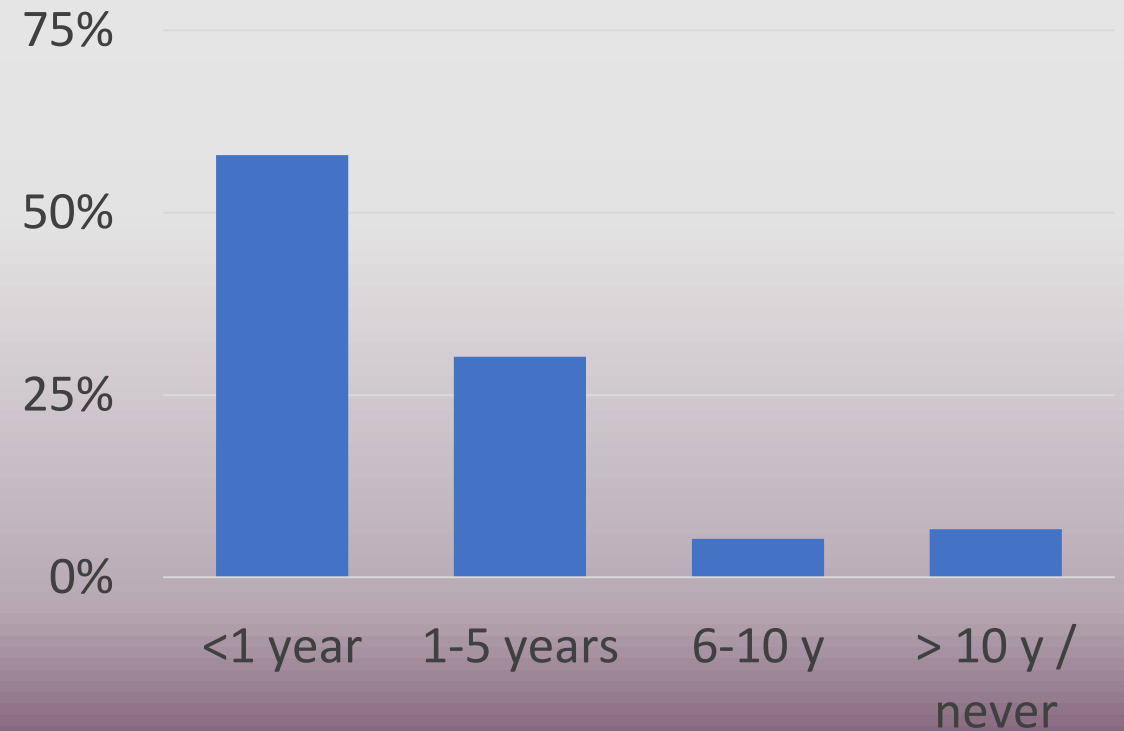


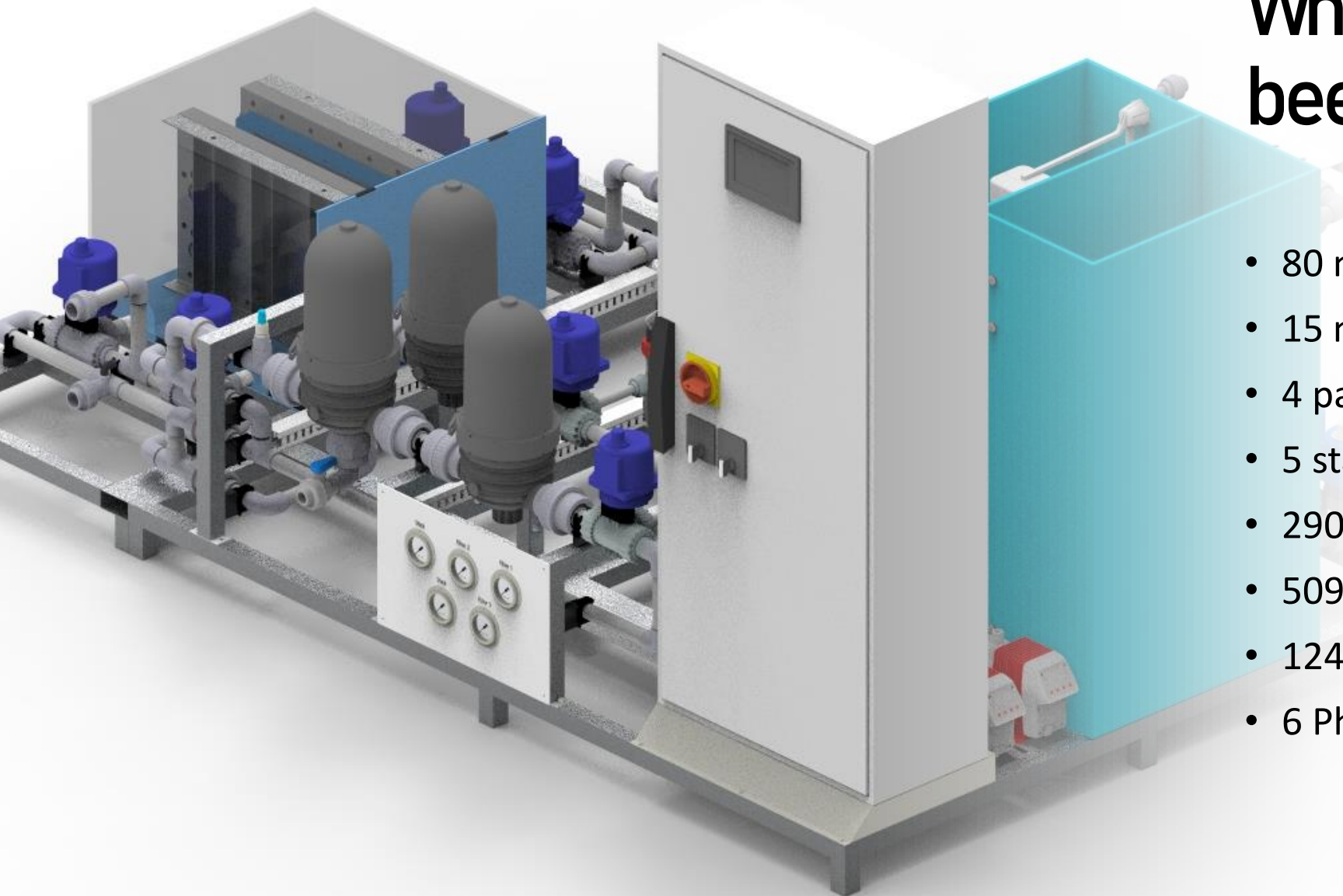


# Value for industry & science

- **93%** of the projects achieve (most of) the goals formulated in the project plan
- **12%** of the projects obtain additional, unforeseen results
- **58%** of the projects yield results that are immediately used in practice

*Use of project results in practice:*





# What else has been achieved?

- 80 new products
- 15 new product processes
- 4 patents
- 5 startup companies
- 290 trade press articles
- 509 presentations for professionals
- 124 scientific papers + 58 expected
- 6 PhD dissertations

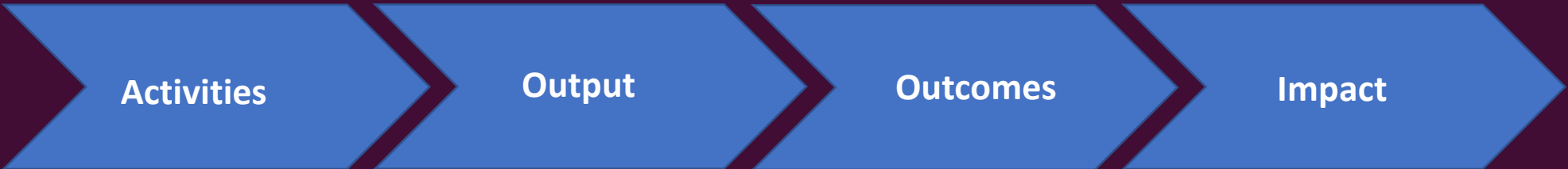
# Example from one of the case studies

**Patent on a new type of packaging film that allows selective gas exchange**



- Biobased film, allows vegetables to stay fresh longer
- The finding was a lucky coincidence: the material was a remnant from an unrelated research project of a colleague
- The researchers point out that the project budget gave room for this type of unexpected result





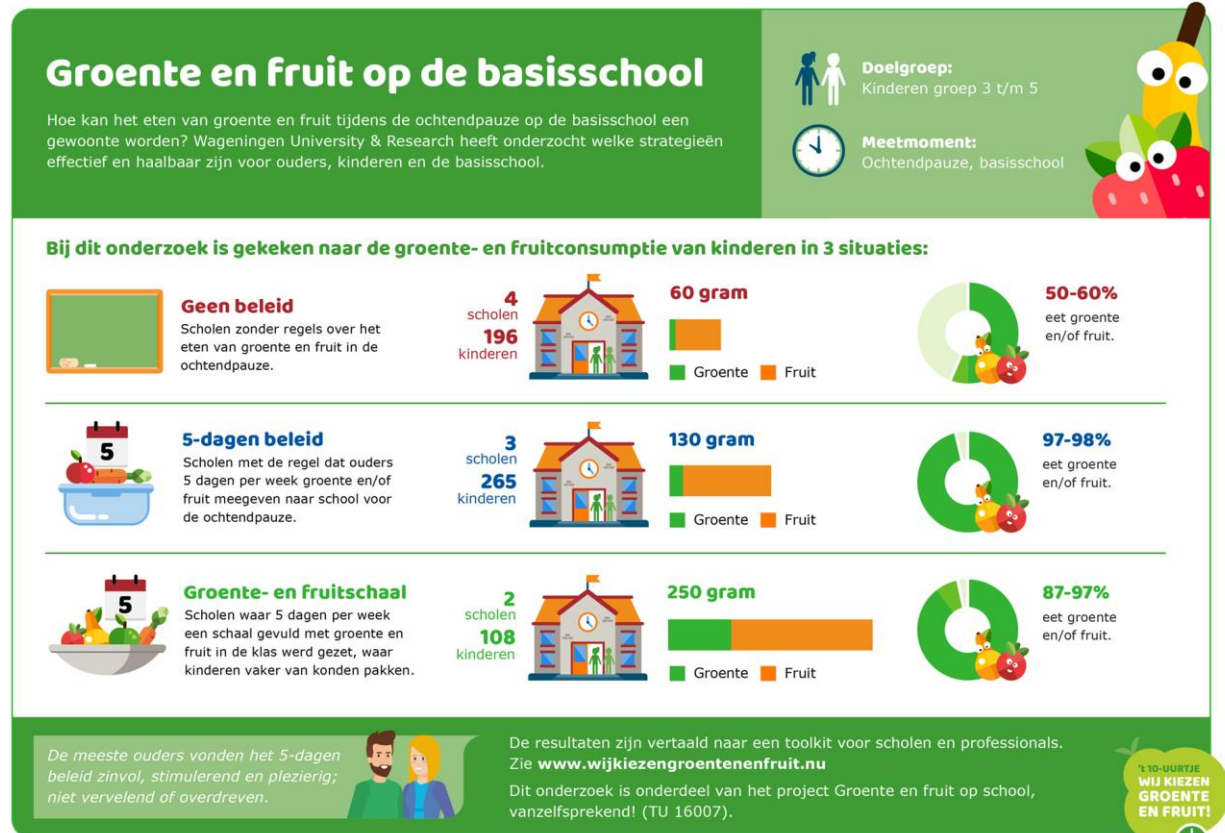
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Network	● ●	●	● ●	
Economy		● ●	● ● ● ● ● ●	
Society		●	● ● ●	
Public policy		● ●	●	
(Science)	●	●	●	

# Value for society

- **63** expressions in general media (newspapers, radio, television)
- **216** publications in online media
- **44** lectures for a general audience

# Example from one of the case studies

- The vast majority of children **doesn't consume** the recommended amount of fruit and vegetables
- A simple strategy, that is acceptable for parents and schools, appears to **double the intake of fruit and vegetables** among children at primary schools
- This **strategy is now the basis** for organisations aiming to improve health at schools in the Netherlands



Activities

Output

Outcomes

Impact

Network



Economy



Society



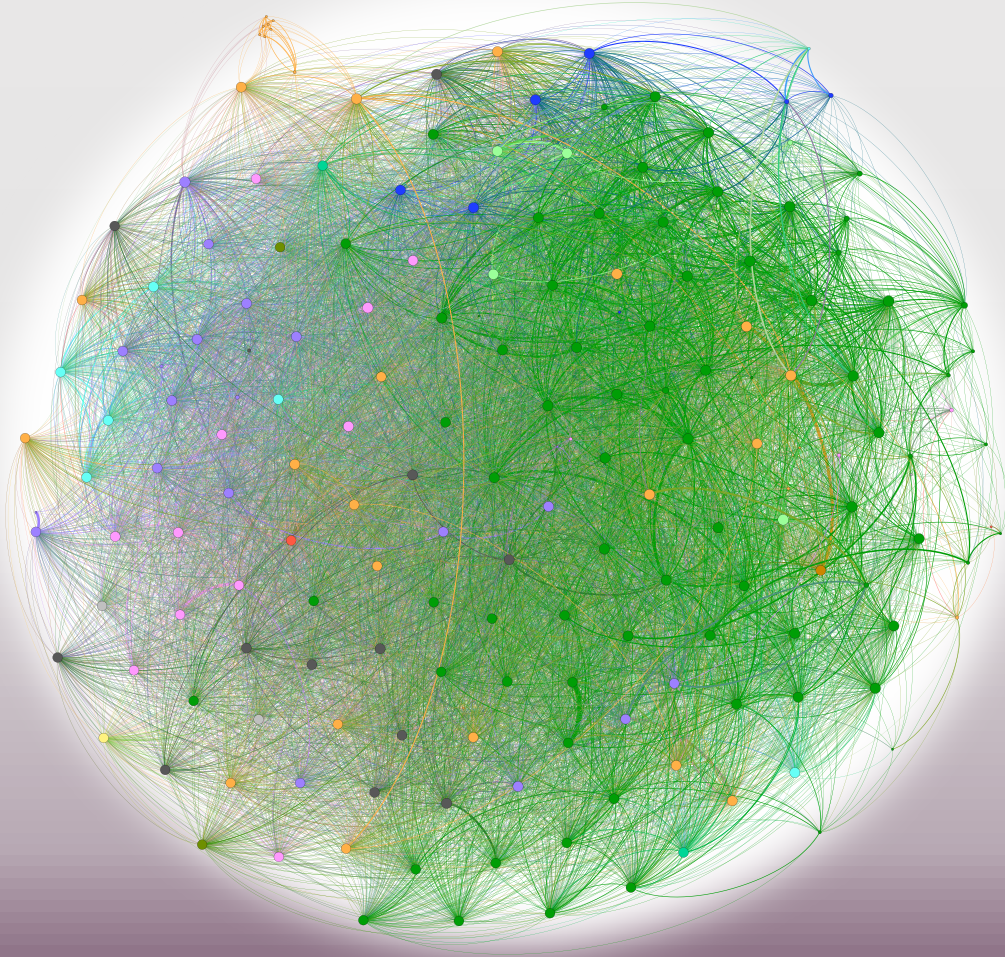
Public policy



(Science)



# Value for public policy



- All projects contribute to one of the missions of the Dutch government for agriculture, water and food
- 41% of the projects contribute to 'robust cultivation systems'
- 66 presentations for government authorities



# Example from one of the case studies



- The European Commission is developing methodologies to calculate environmental footprints of products
- This will make fair comparisons possible, will be a basis for consumer communication, and will guide actions for further improvement
- Project 'Hortifootprint' contributes to the development of the official EC methodology for horticultural products

**What can we learn from all this?**

# Statistical modeling of quantitative data

Project traits		Project outcomes and societal contributions			
		Model 1: achieving project aims	Model 2: Follow up projects	Model 3: Use of results in practice < 1 yr	Model 4: new products, processes, patents, startups
Basic traits	# Private partners		**		**
	Total # partners		*		
	Private contribution			*	
	Total budget				**
Project management	Go / no go moment			**	
	Project mutations	***			
Dissemination of results	General media		**		
	Public authorities	**		**	

■ Large negative effect  
■ Modest negative effect

■ Large positive effect  
■ Modest positive effect

\* =  $P < 0.1$ ; \*\* =  $P < 0.05$ ; \*\*\* =  $P < 0.01$   
 $R^2$  ranges from 0.21-0.43

# Recommendations to further increase the impact of Topsector research (1/3)

## Consortium:

1. For fundamental research, aim for more private partners. For market oriented innovation, aim for less private partners
2. Aim for robust consortia, that contain all relevant expertise as well as organisations that develop results further

## Project aims:

3. Consortium partners jointly define goals, with a focus on the societal impact
4. Project plan based on main outlines allows for flexibility



# Recommendations to further increase the impact of Topsector research (2/3)

## Budget:

5. Greater budgets facilitate the development of market oriented innovations
6. Results are used more rapidly in practice if the private contribution is higher (either in cash or in kind)

## Project management:

7. Offer more supervision and guidance to projects around “go / no go” decisions and project mutations
8. Project management skills of researchers are vital to the success of public-private partnerships



# Recommendations to further increase the impact of Topsector research (3/3)

## External communication:

9. External communication contributes to the success and impact of projects
10. Don't postpone external communication until the project is finished





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