

Novel Ecosystems

An Analysis of the Influence, Usefulness and State of
the Concept from a Dutch Perspective

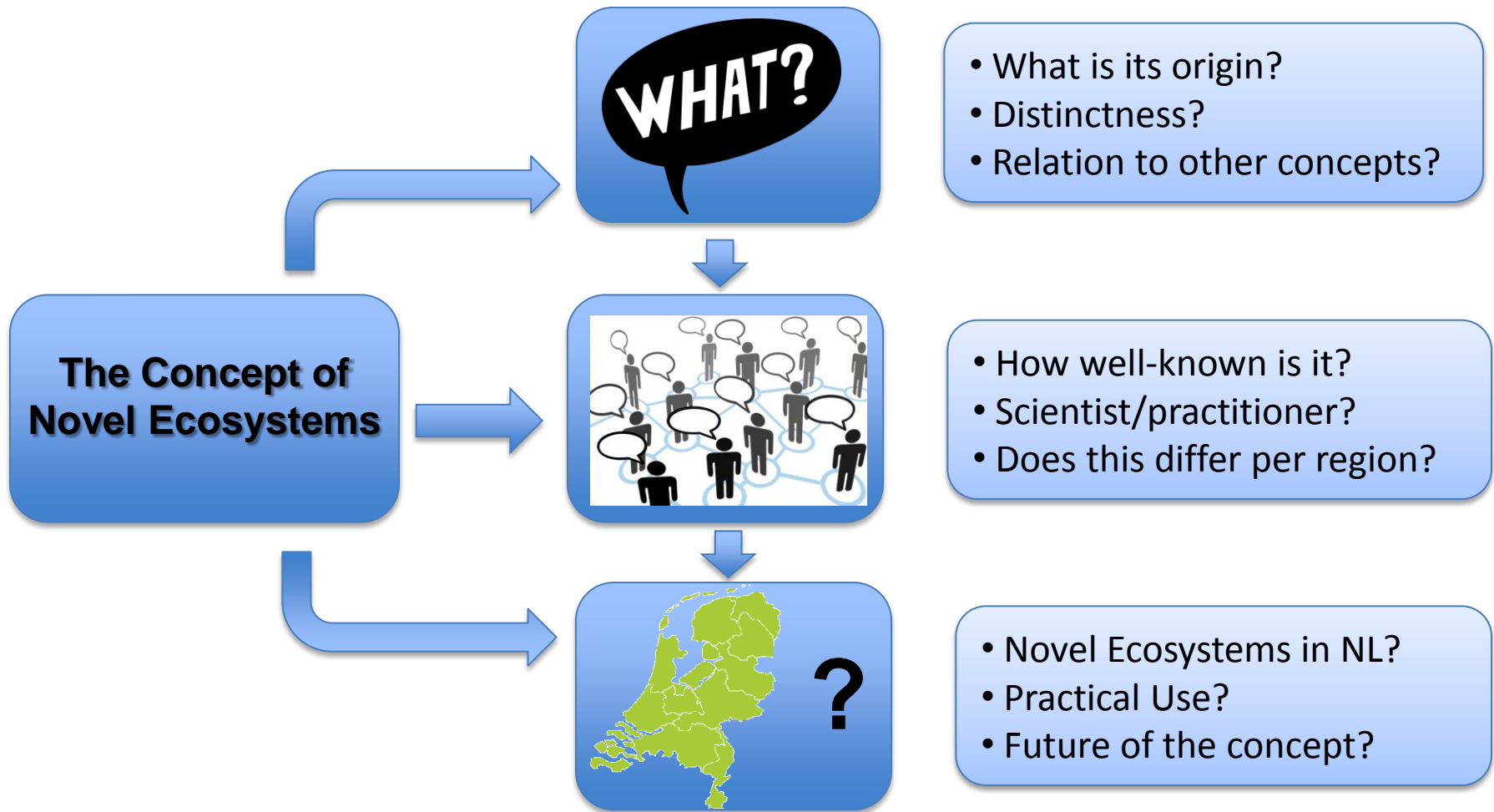
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This research seeks to clarify the current 'state' of the concept and investigate the potential use for the Netherlands



To answer these research question, the research is structured into three main parts:

1: The Concept of Novel Ecosystems

Extensive literature research



2: Familiarity of the Concept

Short survey send out among scientists and practitioners worldwide and in the Netherlands



3: Novel Ecosystems in the Netherlands

Three case studies of possible 'novel ecosystems' combined with expert interviews



Subconclusions part 1: what is the current theoretical state of the concept?



Strengths

1. New theoretical concept gaining momentum/attention
2. Recognizes rapid-changing, human-dominated environment
3. Good communication tool
4. Offers a new perspective on ecosystems first considered useless



Weaknesses

1. Scientific soundness is questionable, multiple interpretations possible.
2. There is a gap between the novel system and its history
3. Very theoretical, few examples are known/studied.
4. The need for the concept and its usefulness is not agreed on

A short survey was conducted among scientists and practitioners in the field of (restoration) ecology and nature conservation

Globally



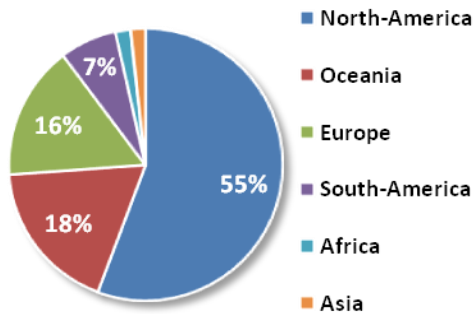
SER
SOCIETY FOR
ECOLOGICAL
RESTORATION



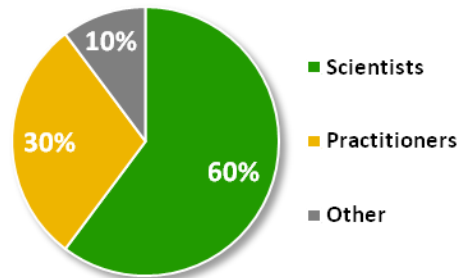
Society for Conservation Biology



Origin



176 respondents



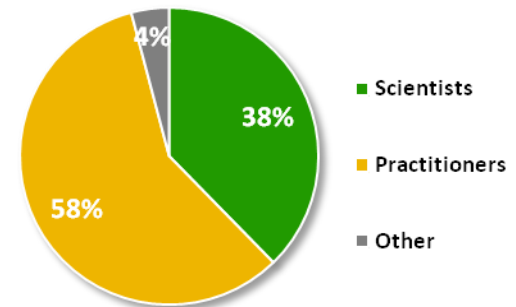
The Netherlands



dienst landelijk gebied
voor ontwikkeling en beheer



122 respondents

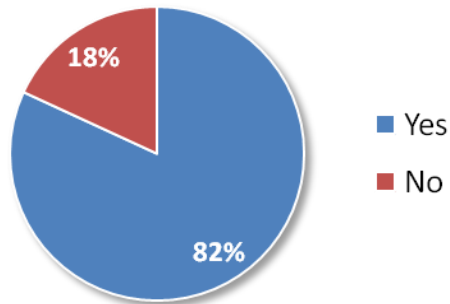


The concept appears rather unknown in the Netherlands in comparison to the rest of the world. Practitioners seem (somewhat) less familiar with the concept.

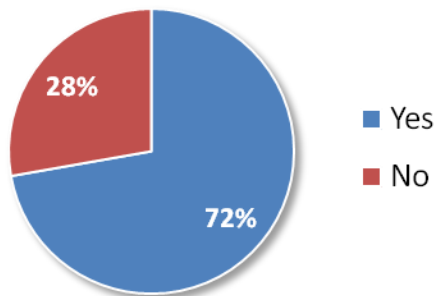
1. Have you ever heard of the concept of Novel Ecosystems?

Globally

Scientists

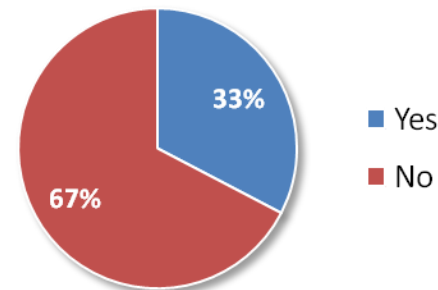


Practitioners

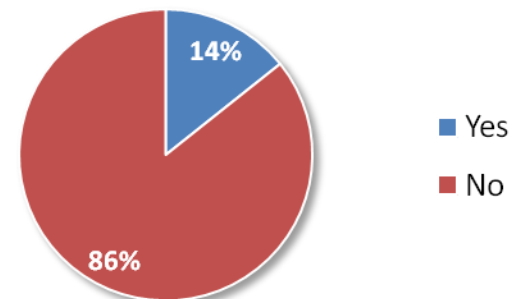


The Netherlands

Scientists

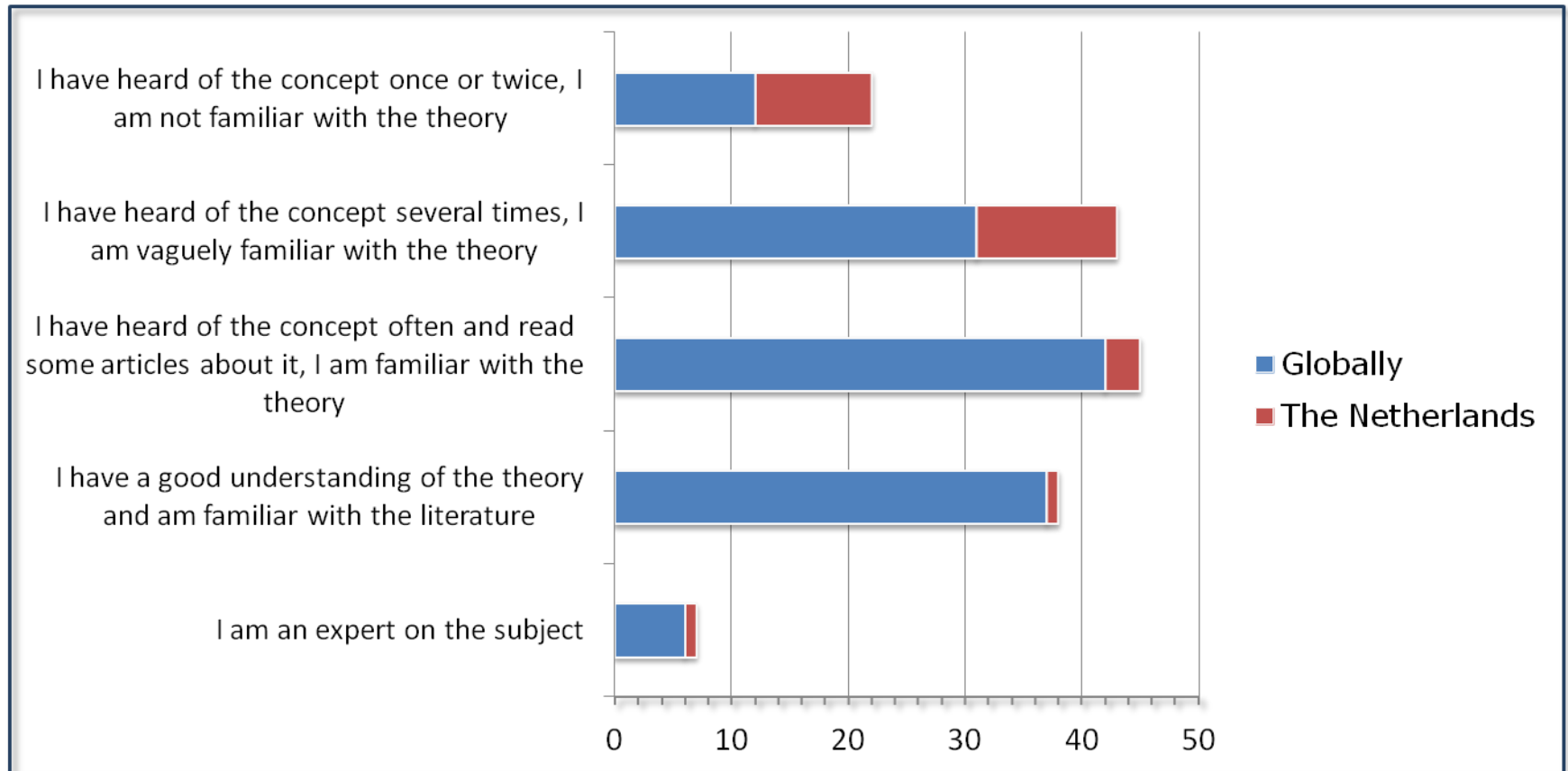


Practitioners



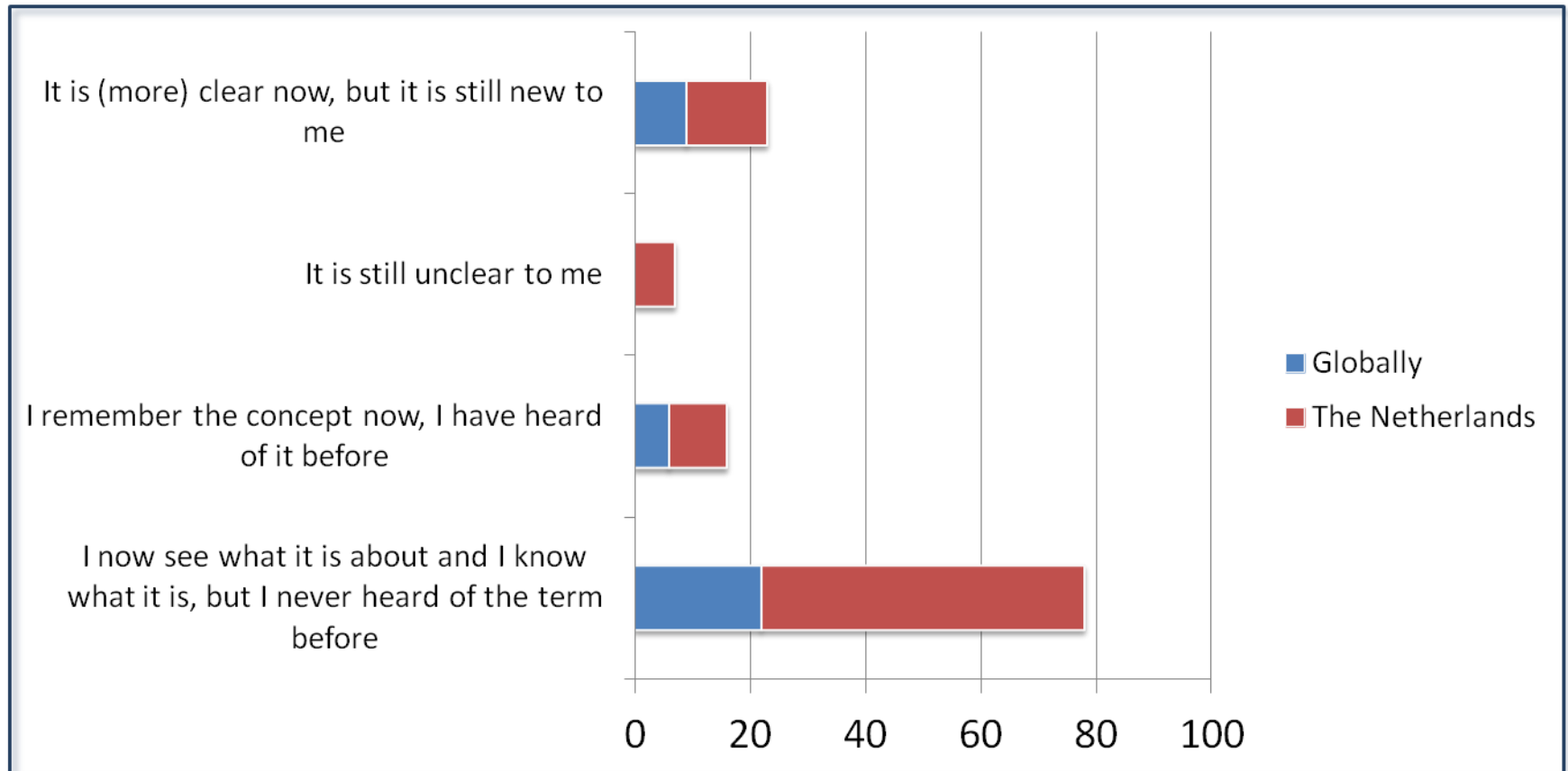
The degree to which the respondents are familiar with the theory, differs, but the majority has a good understanding of the concept. This is not the case for the Netherlands, where only a small minority has this.

2. If yes, how familiar are you with the theory?



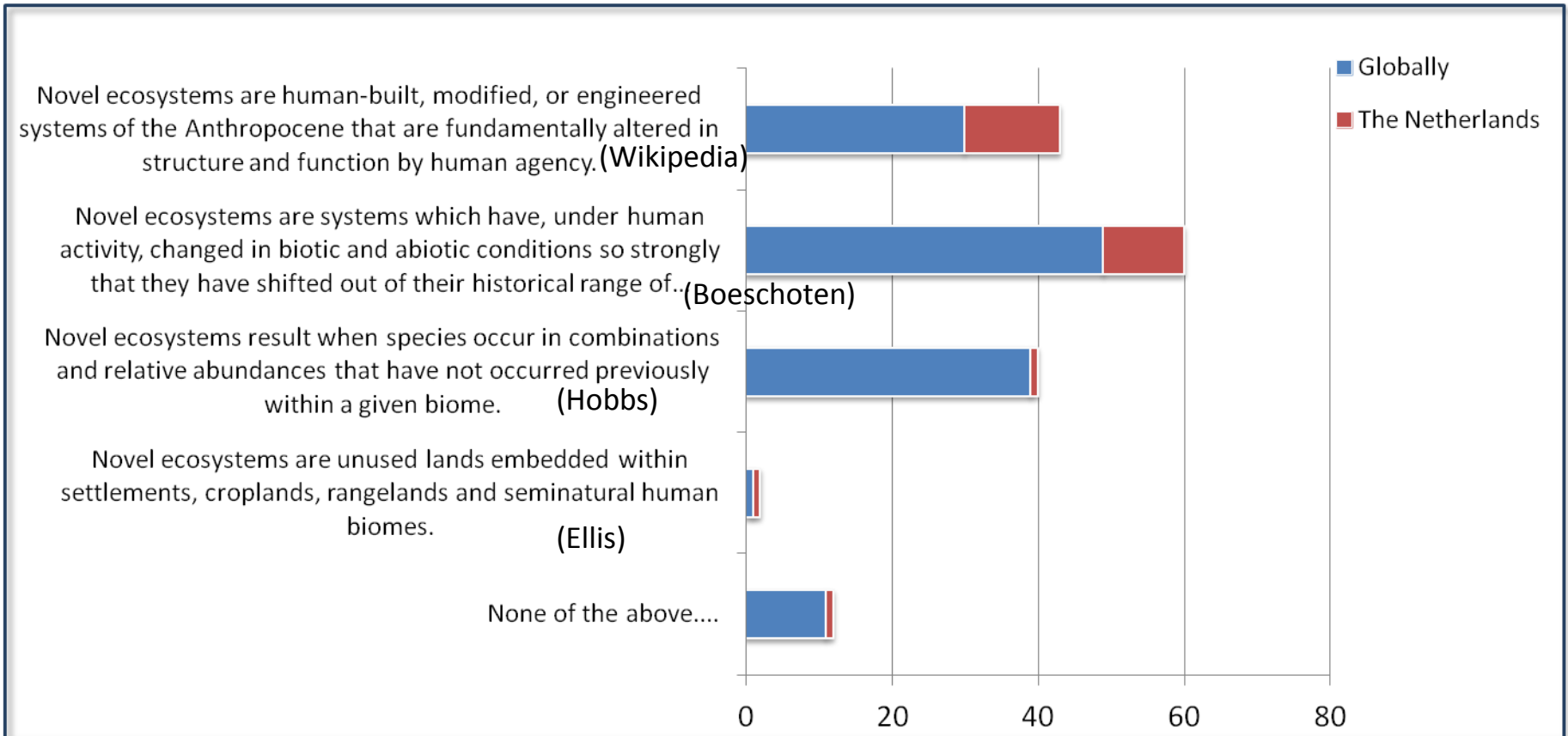
The vast majority of the respondents who answered 'no', were familiar with the theory, but had not heard of the term..

1. (After having read a short explanation) What is your first response to the concept?



There was no agreement among the respondents on the definition and the 'winning' definition was not used before.

1. What definition do you think fits Novel Ecosystem the best?



Subconclusions part 2: what were the main findings of the survey?

1. The concept is quite well-known globally among both scientists and practitioners of SER & ConBio.
2. The concept appears not well-known among the Dutch, but when asked further, the majority knows what the theory is about.
3. The concept appears somewhat less-known among practitioners, especially in the Netherlands.
4. There is no consensus on the definition.

However...



- Results may be somewhat biased, because SER has been promoting the concept.
- It is questionable if groups are comparable..

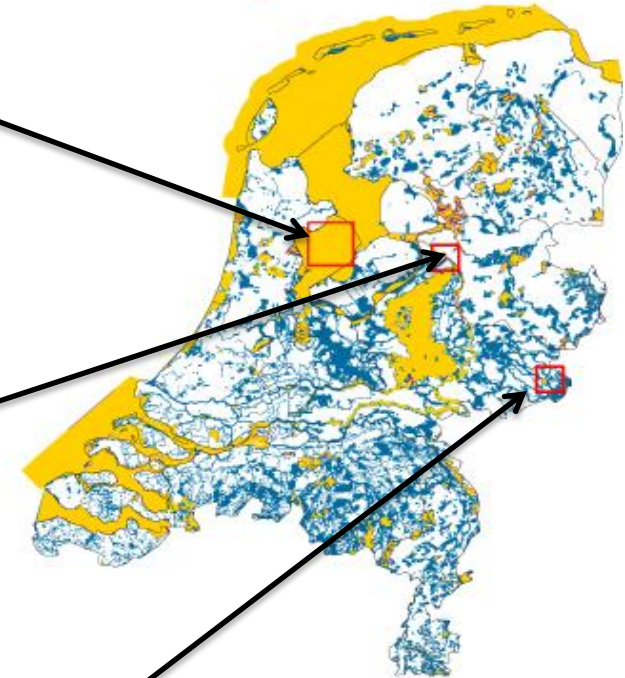


Three different sites where chosen to examine the usefulness and proper approach of the concept of 'novel ecosystems' for the Netherlands for these different sites.

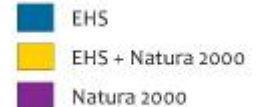
- 'Marker Wadden'
 - To be developed
 - Multifunctional
 - Irreversible
- 'Vreugderijkerwaard'
 - Floodplain IJssel-river
 - New combinations
 - Human influence
- 'Korenburgerveen'
 - One of the last raised bogs
 - Conservative, costly restoration



EHS en Natura 2000-gebieden



Bron: LNV



Marker Wadden would qualify for a novel ecosystem, because of its fundamentally altered state and its incapability to be restored to a historic, pristine state.

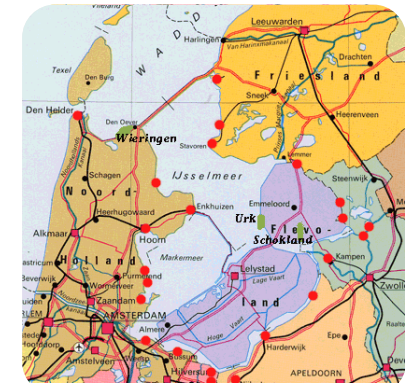
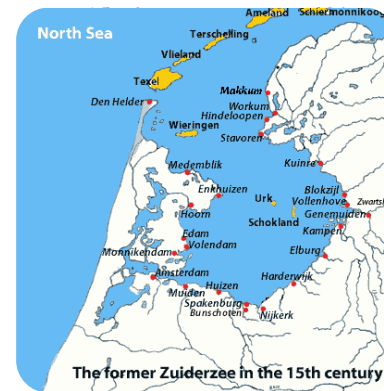
Situation at the present

- Good example of excessive human impact
- Irreversible to 'historic situation'
- Dike → Accumulation of silt → degradation

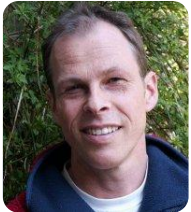
Plans for the future

- Archipel of islands
- Through deep gullies → catching silt → creating islands

15th century vs. Present



Roel Posthoorn (Project manager 'Marker Wadden')



- The plans are build on what is 'unique Dutch nature; open coastal marshes'
- Some elements 'copied' from other freshwater lakes in Europe, but...
→ different because of a lack of continuous waterflow
- The main goal is to bring system in a fundamentally better state
- Creating circumstances → permanent effort → but working with natural processes.
- Sand for construction → multifunctional



Although it is in a very different state than before, it is questionable whether the Vreugderijkerwaard really is a 'Novel Ecosystem'

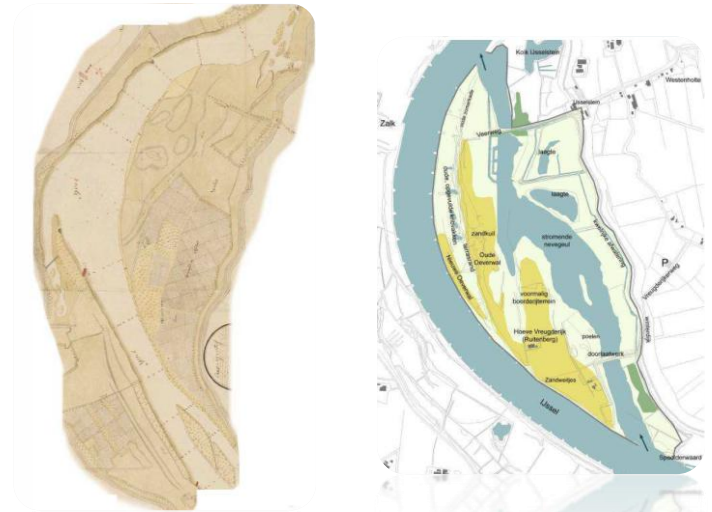
A new, man-made ecosystem

- 2 km long gully (2003), to give river and nature more space.
- Protects nearby city Zwolle against floods
- Multifunctional (human and nature benefit)
- With succes: now a hotspot of biodiversity

But is it a novel ecosystem?

- The system differs from its historical state because of human action, but..
- Many of the now common species have a history of being there naturally or were introduced for cultural reasons.
- The system not differs fundamentally from river marginal ecosystems.
- So is this novel? And if you would qualify it as novel, what value would that add?

18th century vs. Present



Korenburgerveen is obviously not a novel ecosystem, but would have become one if no measures were taken.

History

- Originated after last Ice Age, peat layer developed in Holocene
- Part of the only 2% of original Dutch raised bog left
- Area itself untouched, but surrounding area heavily altered through peat mining
- Large parts excavated → ditches were dug → (necessary) rainwater drained off.



Restoration

- Large-scale restoration (expensive, helicopters, heavy machines)
- Dams and dykes built to keep rainwater level high
- In 50 years a new peat layer developed



Novel Ecosystem?

- Some would say that the system was on the verge of *becoming* a novel system
- Would knowledge of the concept have led to other decisions?
- And if so, is this a good idea? Should science label systems? →



In reaction to these questions, what do the experts say?



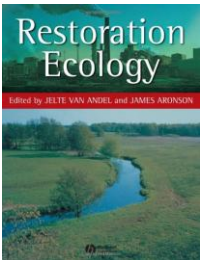
Ab Grootjans – Professor in Plantecology and Eco-Hydrology, expert on restoration of damaged wetlands

‘It is society that decides what happens to an ecosystem, and what matters is that achievable targets are set. But an area as Korenburgerveen can never be labelled novel, if you’re not restoring it you’re rehabilitating it.’



Roel Posthoorn (Project manager ‘Marker Wadden’)

‘Indeed, current policy is often static, and dynamic systems should be approached different, but other systems benefit from a certain degree of stability’



Jelte van Andel (Professor in Plantecology, Author of Restoration Ecology)

‘The concept is moving beyond its scope and becoming a new point of reference, which is ridiculous. Recognition of novelty is good, but it should not be translated into ‘value.’



Subconclusions of the three parts put together

Part 1: The Concept

1. The concept is gaining momentum and has good potential.
2. The concept is a reaction on too conservative restoration goals.
3. The scientific soundness is questionable
4. It is not clear how it can be put into practice

Part 2: The Familiarity

1. The concept is quite well-known globally but less in the Netherlands.
2. There is no consensus on the definition.
3. Those who don't know the term, know the theory.
4. Practitioners seem to be somewhat less familiar with the concept than scientists.

P3: Novel Ecosystems in NL

1. Marker Wadden would qualify as a novel ecosystem
2. Vreugderijkerwaard, can be debated.
3. Korenburgerveen is not a novel ecosystem.
4. The three different sites show that in case of doubt, the concept loses value.

Take Home Message?



Conclusion

On the concept;

- For enhancing the influence and usefulness of the concept, several aspects should first be agreed upon:
 - improve scientific soundness
 - better distinction between completely new (created) systems and emerging systems
 - build restoration on achievable goals
 - avoid mixing of science and policy

For the Netherlands,

- It appears that in NL, the theory is implicitly known → Marker Wadden good example → Do we miss the concept?

