



Sveriges lantbruksuniversitet
Swedish University of Agricultural Sciences

Bioeconomy

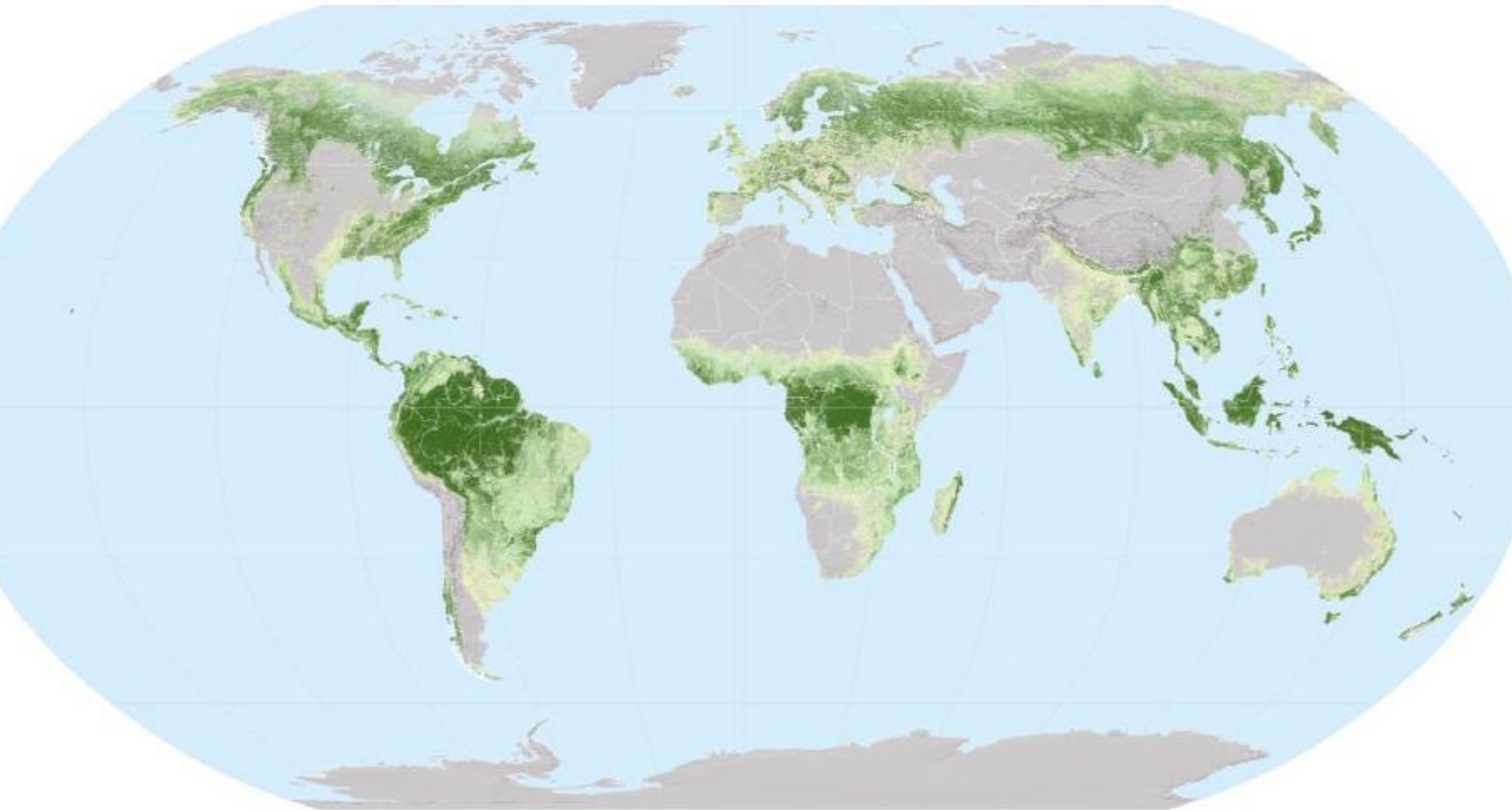
Camilla Widmark

Vice head of department

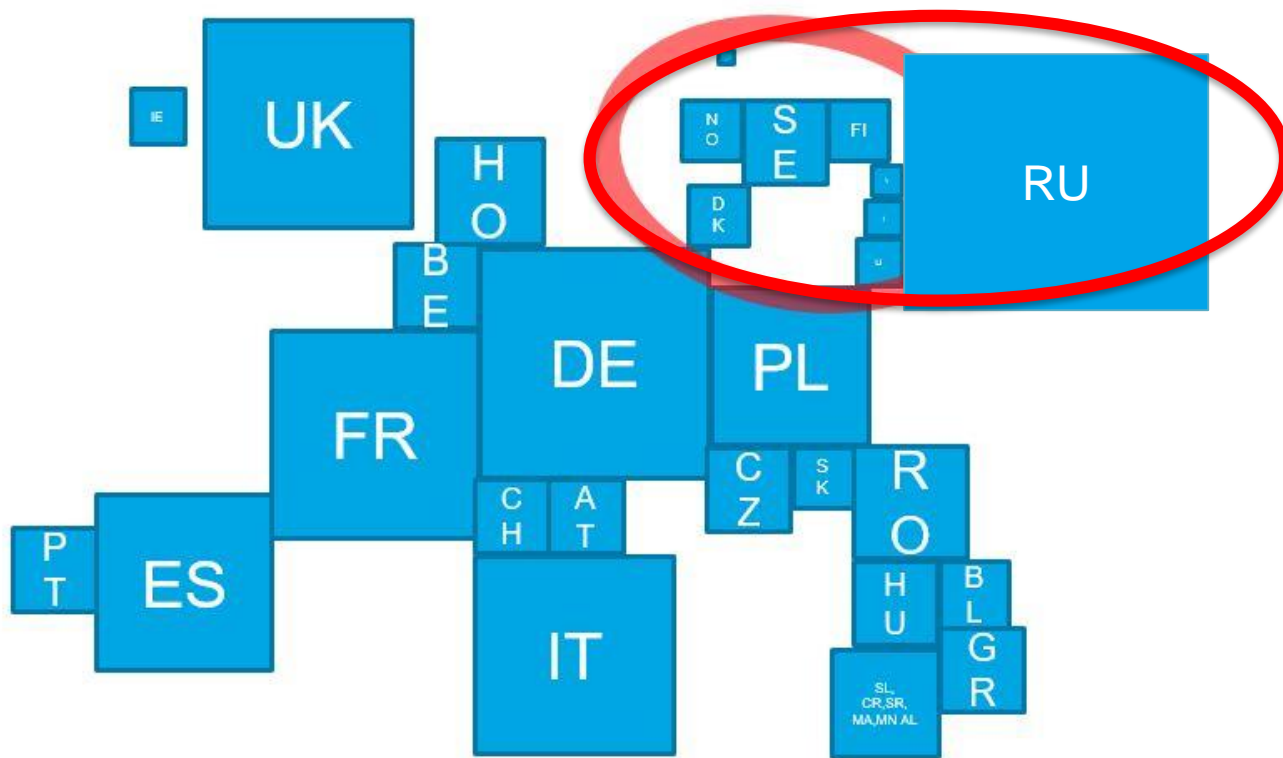
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Head of office, Bioeconomy research network (EFINORD)

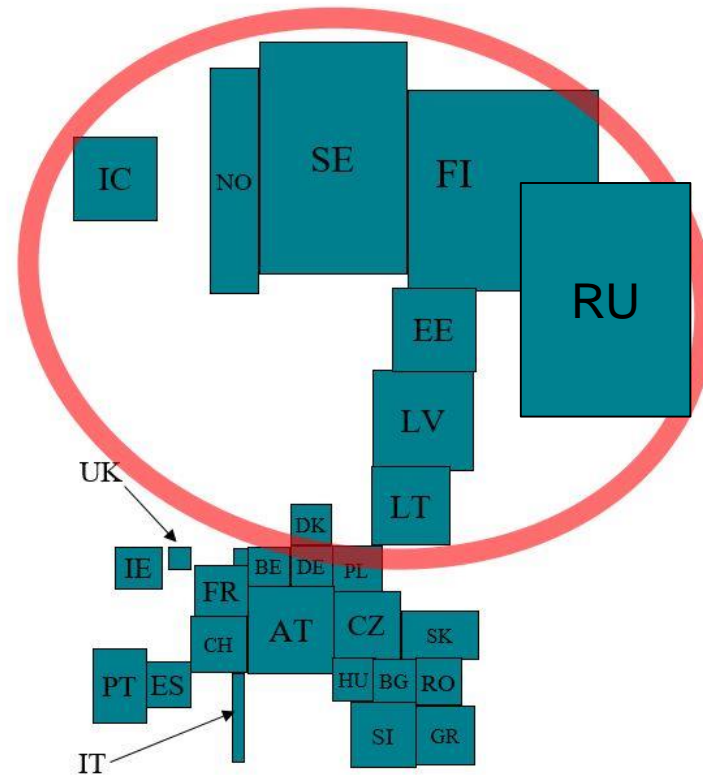
World's forests



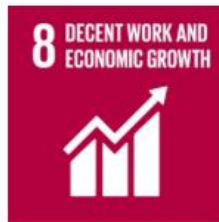
Country size according to population



According to share of forest land

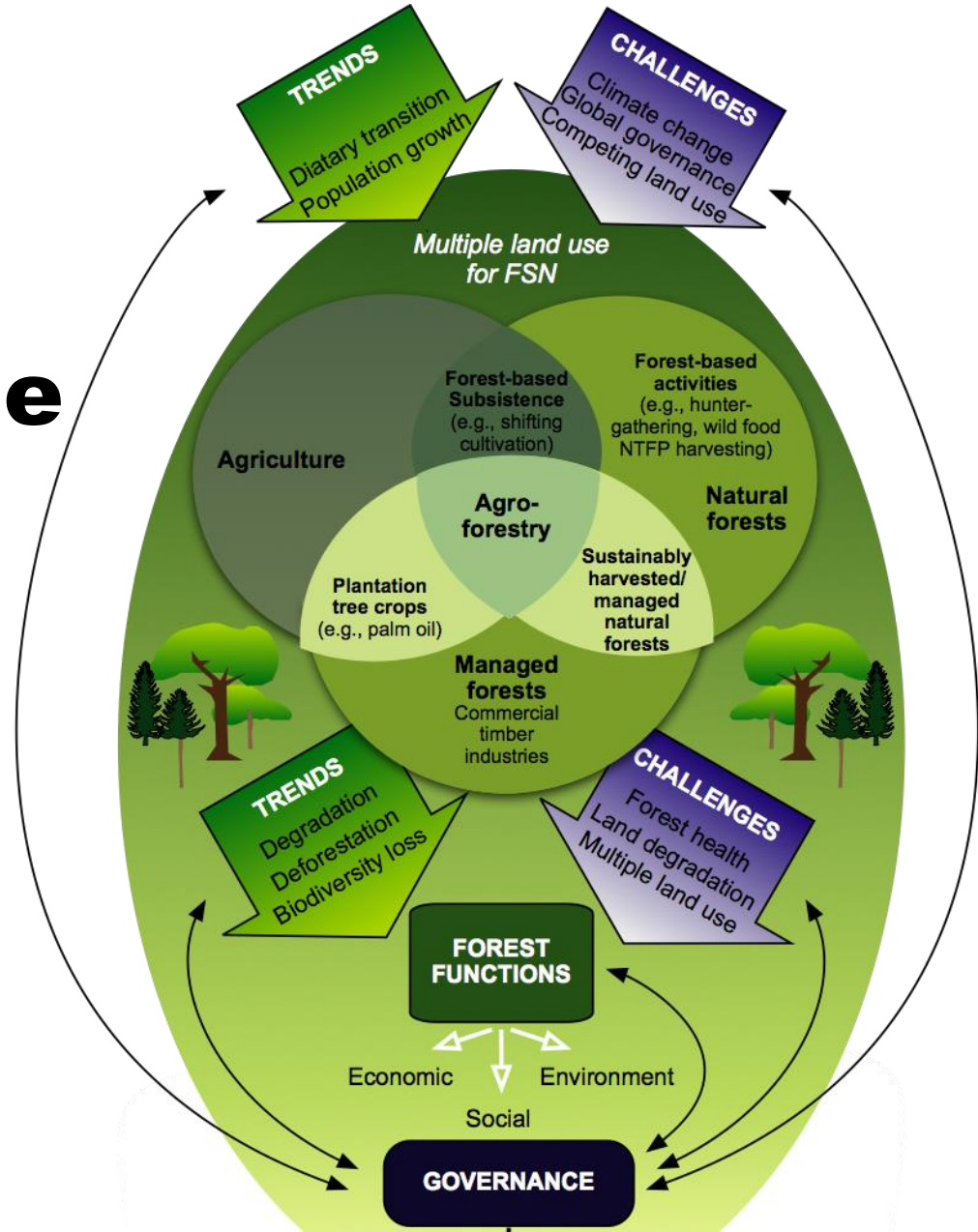


SDG-goals



The forest's role

- Complexity
- How to contribute to SDG?



Bioeconomy transformation

The concept of Bioeconomy

”bioeconomy as the knowledge-based production and utilization of biological resources, innovative biological processes and principles to sustainability provide goods and services across all economic sectors”.

(Global bioeconomy Summit 2015)

Key concept bioeconomy

Natural capital important to successful bioeconomy

Thus need to account for natural capital, measure it and put a value on it...

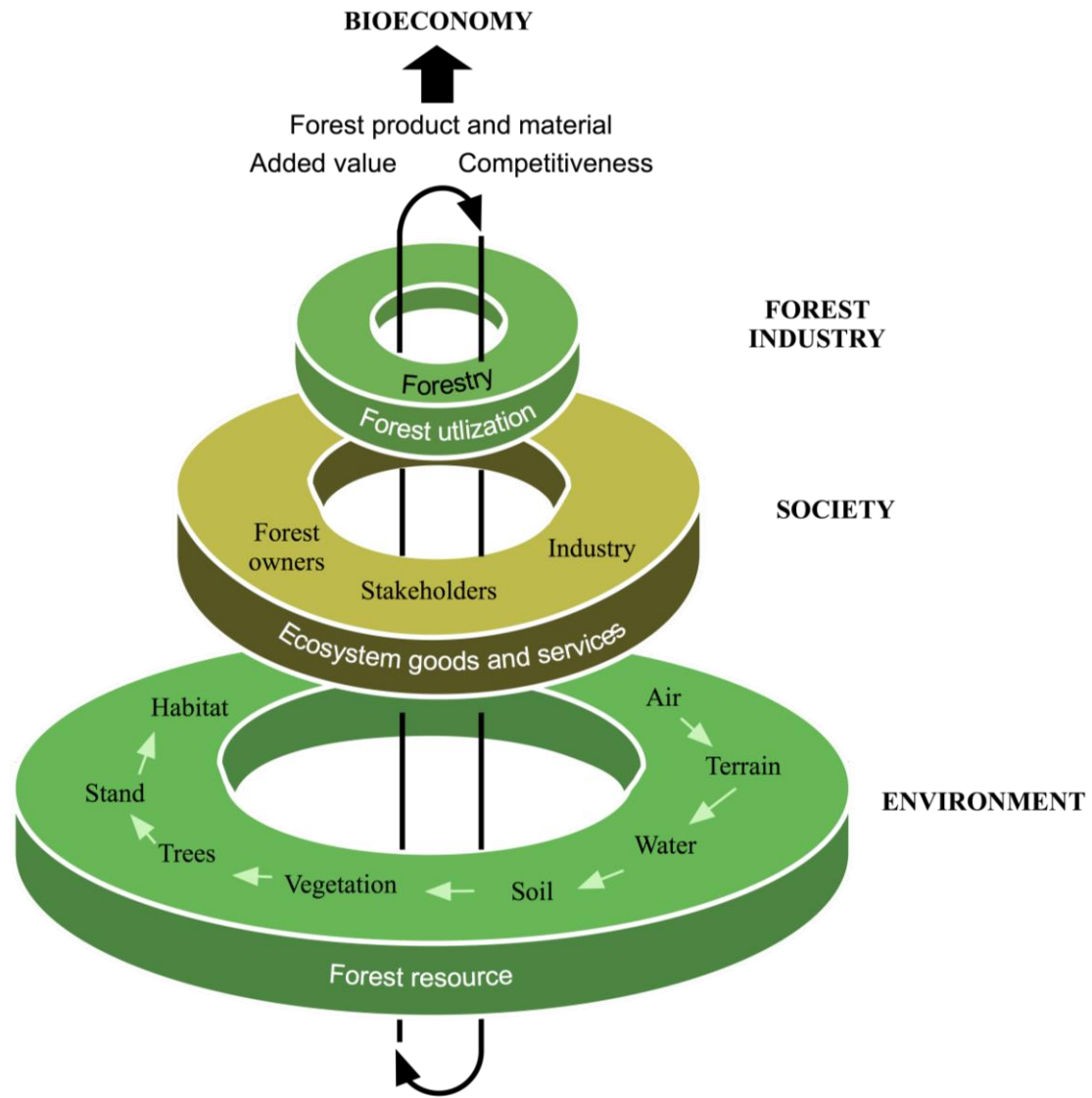
= Ecosystem services

(Costanza et al, 1997; Helm 2015; De Perthuis & Jouvet 2015)

Circular bioeconomy

”aims to keep products, components and materials at their highest utility and value at all times”

(Antikainen et al., 2017)



SUSTAINABILITY



BIOECONOMY



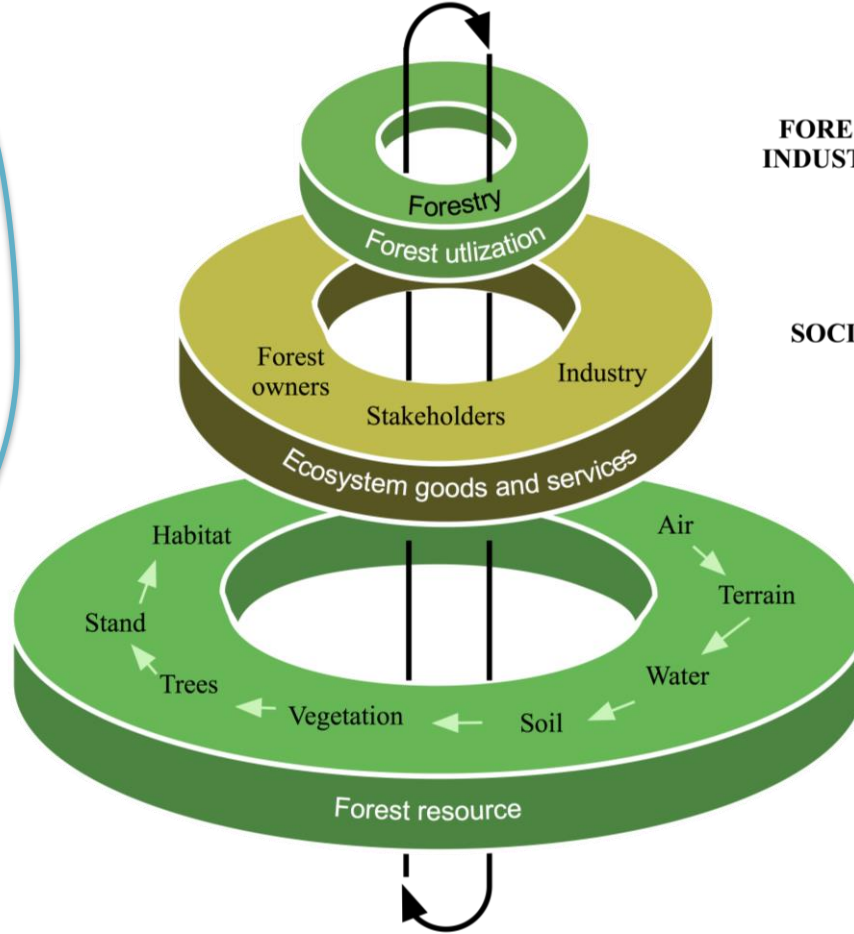
Forest product and material
Added value Competitiveness



**FOREST
INDUSTRY**

SOCIETY

ENVIRONMENT



SUSTAINABILITY



Renewable products

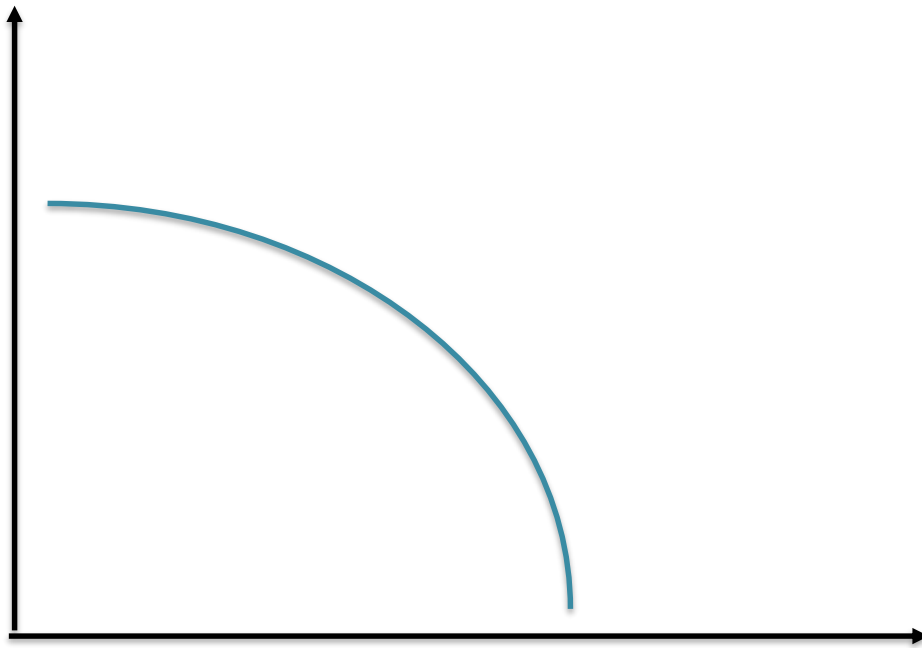
Bioproducts

Biomass



Synergies and tradeoffs

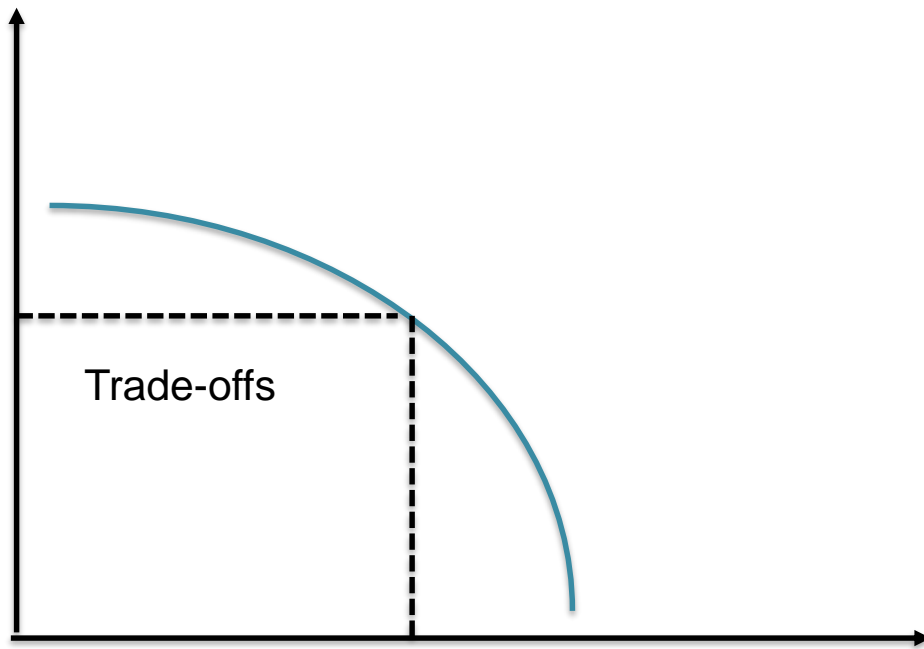
Non-product
ecosystem services



Forest products

Synergies and tradeoffs

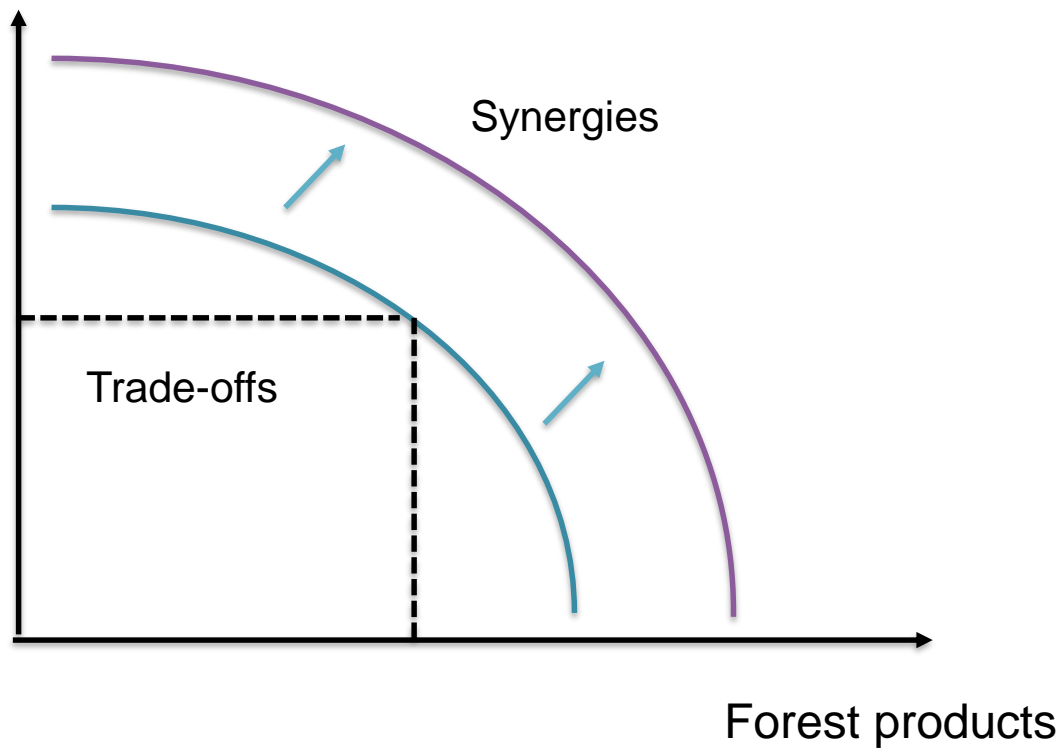
Non-product
ecosystem services



Forest products

Synergies and tradeoffs

Non-product
ecosystem services



Bioeconomy strategies

OECD-countries (2009)

EU (2012)

Sweden (2012)

Finland (2014)

Norway (2016)

Bioeconomy and forest in international research

Since 2009, 36 papers

2017: 15

2018: 11 (so far)

Topics

| | |
|---------------------------------|---|
| Bioeconomy transformation | 1 |
| Corporate social responsibility | 1 |
| Digital solution transformation | 1 |
| Forest policy | 1 |
| Pulp & paper | 1 |
| Value chain | 1 |
| Wastes | 1 |
| Bioeconomy mapping | 2 |
| Bioenergy | 2 |
| Ecosystem services | 2 |
| Environmental regulation | 2 |
| Biorefineries | 3 |
| Carbon sink | 4 |
| Wood resources | 7 |

Research suggests

- Forest important contributor
 - Realized full potential?
 - New products?
 - Understanding value chain
 - Understanding circularity?
 - Understand market forces => how to transform to bioeconomy?
- Environmental sustainability
 - Science-based knowledge of the resource
- Design policy
 - Regulatory framework
 - Carrots and sticks?

Research suggests

- Technological change and skills
 - Digitalisation
 - Increasing efficiency
- Social inclusiveness
 - Develop knowledge – to do the right thing
 - Enhance risk-taking capacities
 - Collaboration
- Bioeconomy in itself not sustainable

Challenges for the future

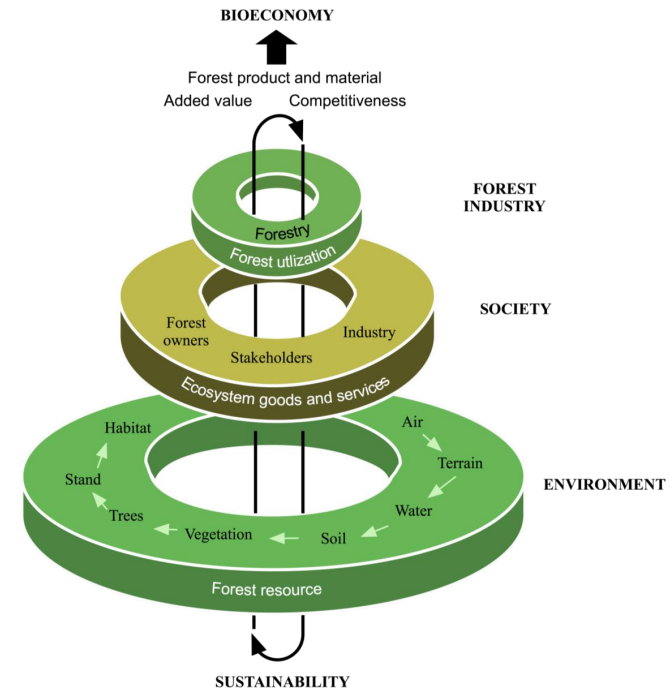
How to include society?

How to encourage markets to create circular bioeconomy?

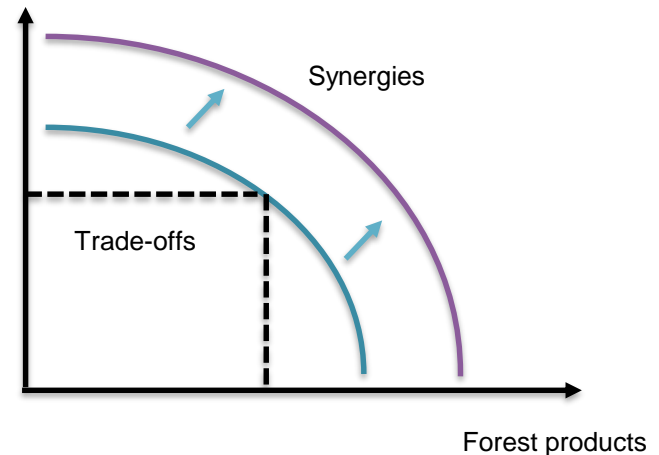
How to make synergies stronger and trade-offs minimized?

How to fill the gaps in bioeconomy strategies?

Collaboration needed?



Non-product ecosystem services





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Thank you for your attention

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