Better forest policies and management for sustainability transformations –

How can expectations for forests be met?

ForestValue Final Conference, Madrid, 28-29 September 2022

Project: **Management for multifunctionality in European forests in the era of bioeconomy** https://www.jyu.fi/science/multiforest

Project acronym: MultiForest

Mikko Mönkkönen, University of Jyväskylä, Finland

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 773324

MultiForest

Project partners

University of Jyväskylä, Finland

International Institute of Applied Systems Analysis, Austria

Technical University of Munich, Germany

Swedish University of Agricultural Sciences, Sweden

Finnish Environmental Institute, Finland

Norwegian Institute of Bioeconomy Research (NIBIO), Norway

FinnOpt / SILO.AI Ltd, Finland

- Total project budget: 1.845.000€

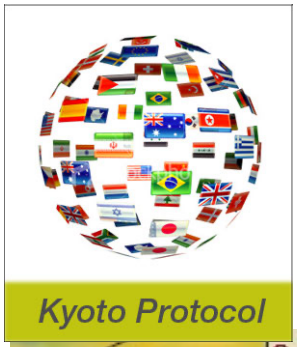
- Project start and end date: 1 April 2019 – 31 October 2022

THE EUROPEAN BIOECONOMY IN 2030

Delivering Sustainable Growth by addressing the Grand Societal Challenges

Forests - various and often conflicting societal demands

- → Increase wood biomass harvesting - bioeconomy
- → Increase wood fuel harvesting – bioenergy



THE EUROPEAN BIOECONOMY IN 2030

Delivering Sustainable Growth by addressing the Grand Societal Challenges

Forests - various and often conflicting societal demands

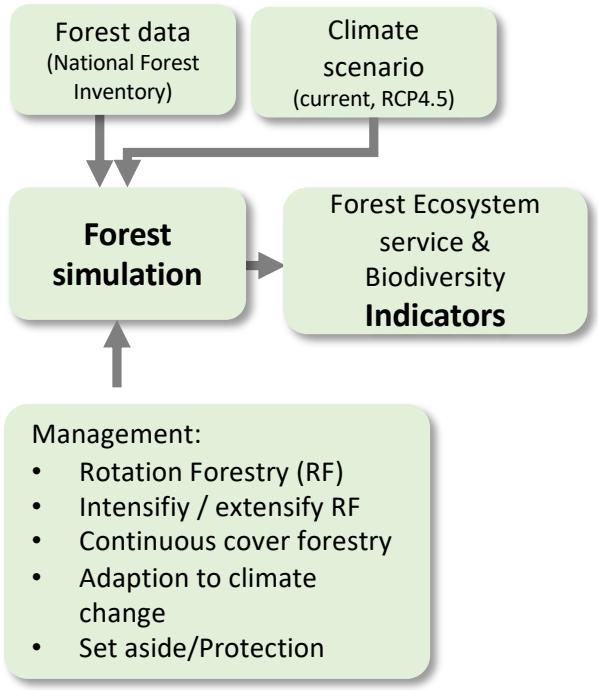
- → Increase wood biomass harvesting - bioeconomy
- → Increase wood fuel harvesting – bioenergy
- → Halting biodiversity loss
- → Safeguard ecosystem services
- → Contribute to climate change mitigation

Conflicting policies?

- → Incoherent? → Inefficient?
- → Effects on ecosystem services – multifunctionality?
- → What management is needed for multifunctionality?

ForestValue Workflow

DATA



ForestValue Workflow

DATA

SCENARIOS

Modelling for EU climate change mitigation targets and EU 2030 Biodiversity strategy

Forest data (National Forest Inventory)

Climate scenario (current, RCP4.5)

Forest simulation

Forest Ecosystem service & Biodiversity **Indicators**

Management:

- Rotation Forestry (RF)
- Intensifiy / extensify RF
- Continuous cover forestry
- Adaption to climate change
- Set aside/Protection

National scenarios for three national policies

- National forest strategy
- Biodiversity strategy
- Bioeconomy strategy

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Optimization

Ecosystem service & biodiversity demands

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Optimal forest management for demands

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Analysis

i. Timber demand achievement
ii. Management requirements
iii. Impacts on forest ecosystem services

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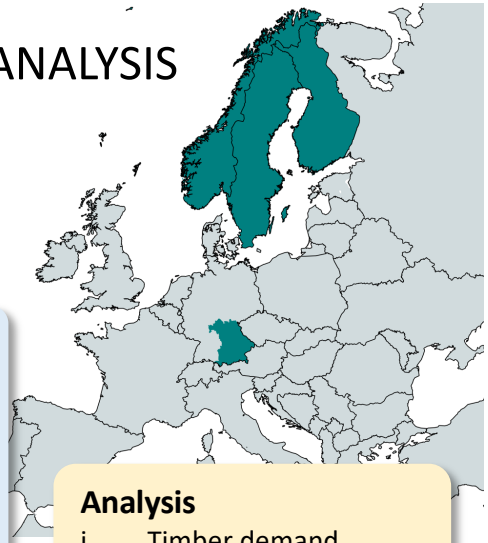
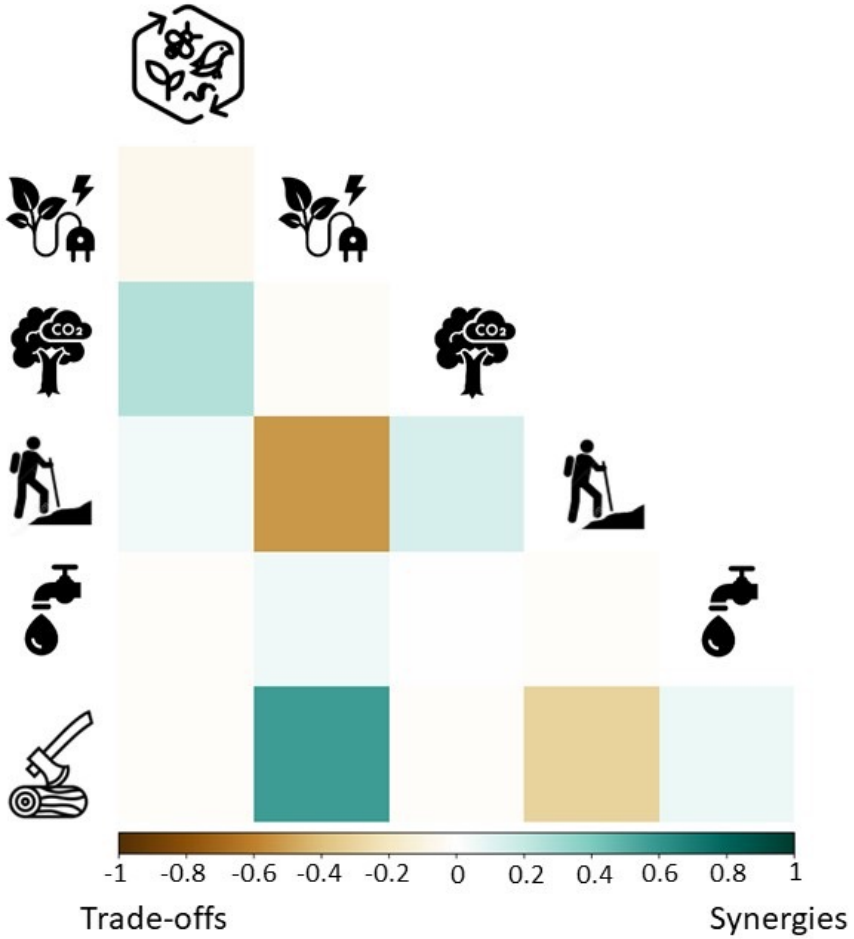


Analysis
i. Timber demand achievement
ii. Management requirements
iii. Impacts on forest ecosystem services

Study regions:
- **Finland**
- **Sweden**
- **Norway**
- **Germany (Bavaria)**

Results Policies should acknowledge the interactions and balance the trade-offs among forest ecosystem services instead of narrowly focusing on prominent ecosystem services

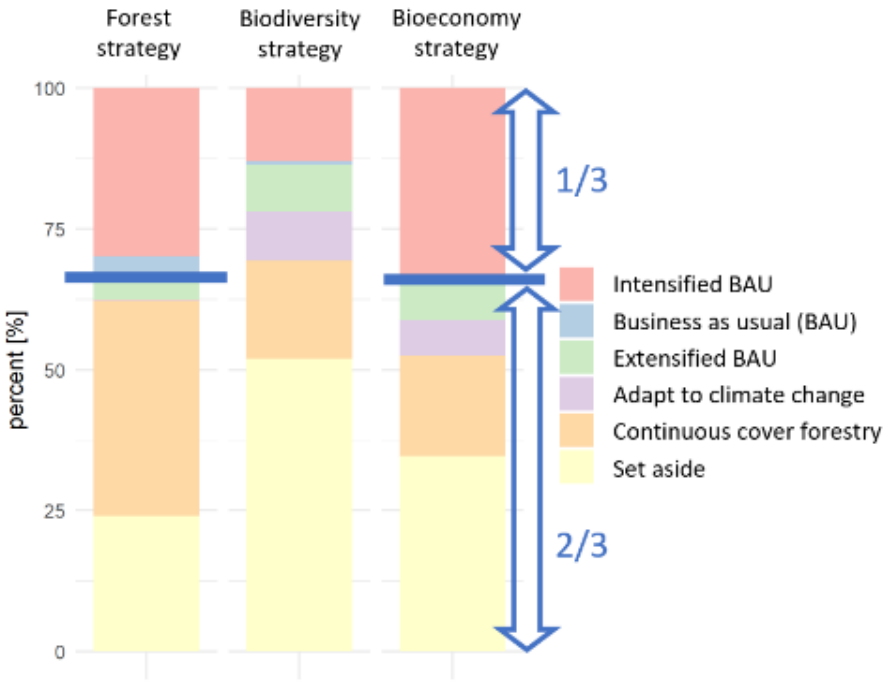


Forests are subject to multiple socio-ecological pressures and socio-economic needs.

Disregarding trade-offs between policy objectives may cause unpredictability in policy implementation.

In Norway, management plans maximizing forest multifunctionality improve the synergies between forest ecosystem services, such as bioenergy, wood provisioning and carbon mitigation. Other services, such as recreation, may become harder to achieve, as they conflict with ecosystem services more likely to be promoted by active management or existing policy objectives.

Results Diverse forest management will alleviate the trade-offs between forest ecosystem services

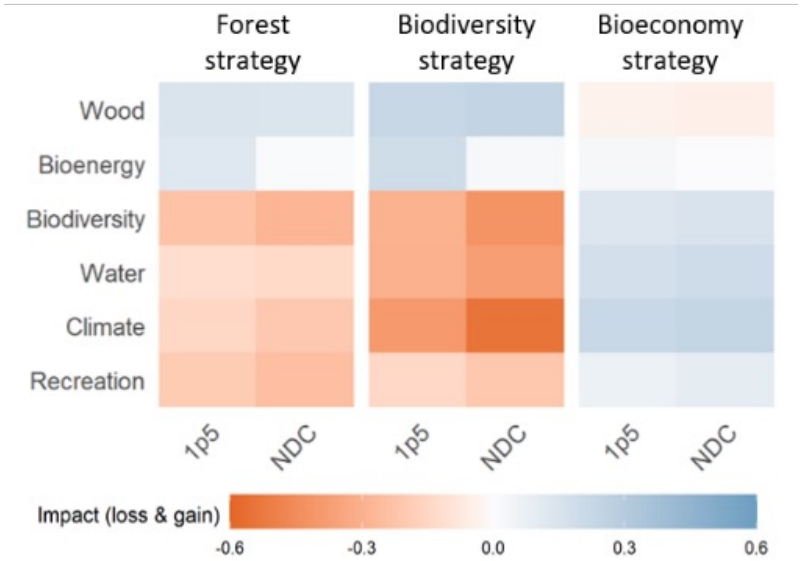


In Finland, the optimal management solution for the Finnish forest policies requires considerable change in forest management.

At minimum 2/3 of the forest should be managed by practices including continuous cover forestry regimes and protected areas to meet the stated policy objectives.

- Allocating the forest landscape into areas with specified management objectives can resolve conflicts among divergent policies.
- This requires a careful definition of landscape objectives in forest management planning to satisfy the requirement of land-use policies.
- Close collaboration with the landowners and societal stakeholders in the implementation contexts is needed

Results Forests play an important role in climate change mitigation, but their contribution should not be over-emphasized



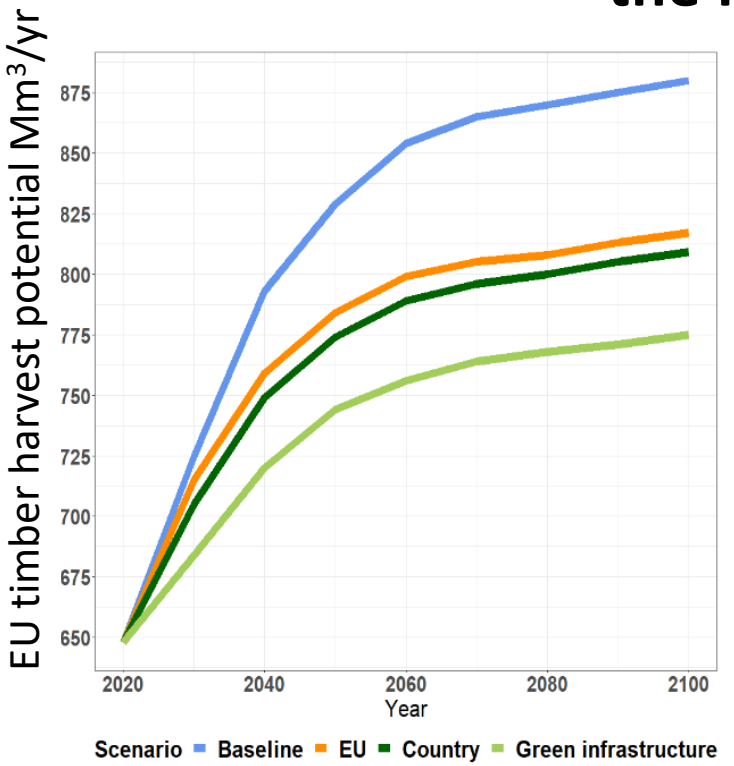
In Germany, prioritizing EU climate change mitigation targets above national land-use policies has impact on forest ecosystem services and biodiversity. There will be increases of wood and bioenergy, but mostly decreases in biodiversity and other non-production services.

1p5 is based on IPCC 1.5-degree Representative Concentration Pathway.

NDC is based on IPCC 4.5-degree Representative Concentration Pathway.

- Forests have several functions in mitigating climate change by storing carbon in trees and timber products, while also maintaining soil carbon stocks.
- However, over-emphasising the role of forests in climate change mitigation can lead to conflicting expectations and negative long-term implications.
- We need to recognize the limits of using forest resources for achieving mitigation targets and societal decarbonization.

Results The achievement of targets set in the EU Biodiversity Strategy for 2030 depends on the distribution of efforts across the member states



The EU Biodiversity Strategy for 2030 allows for increase in forest biomass harvesting, regardless of possible variations in the implementation of increased protection area at EU, country or green infrastructure scale.

On 80-year timescale, the biomass harvesting volumes can decrease by 7%-12% compared to a baseline development, but it would still allow the EU to increase its current harvest levels.

To achieve the targets of the EU biodiversity strategy

- Carefully consider how the 10%/30% objective on strictly protected forests and closer to nature management is distributed
- Sharing the EU Biodiversity Strategy objectives equally among the countries and biogeographical regions

➢ would allow reaching the objectives without major negative impacts on timber production in the EU

➢ does not limit the timber harvesting potential

Impacts - Recommended actions

Promote interaction across the policy domains to improve policy coherence

Develop and implement ambitious biodiversity policies to secure ecosystem sustainability

Develop a strategy to guide diversification of forest managements to sustain multiple ecosystem services at the landscape level

Our policy brief is out: https://doi.org/10.17011/jyu-83309

The value of scientific cooperation

- *Comparable results for different countries*
- *Combination of national scale and continental scale analysis*
- *Stakeholder interaction at the international scale*

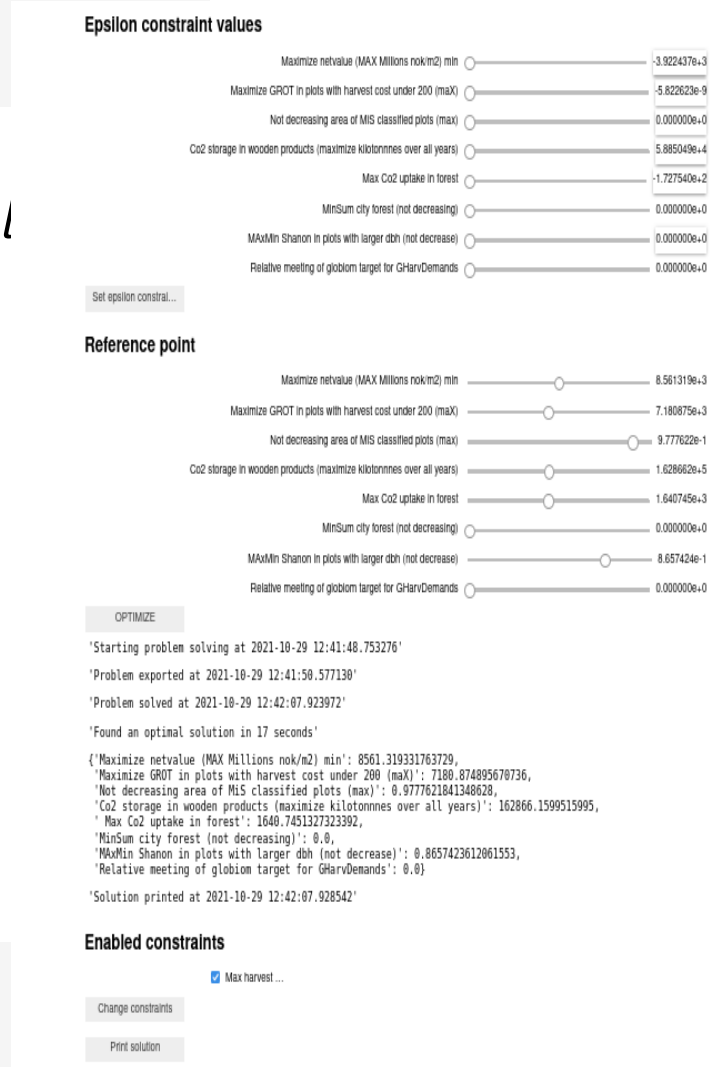
The value of scientific cooperation

```
wood_production_bionergy = {

# harvest net value - maximise
"harvest_netvalue_Mnok_min": ["Maximize netvalue (MAX Millions nok/m2) min",
                              "harv_net_Mnok_TotNor", "max", "min", "sum"],
```

- *Comparable results for different countries*
- *Combination of national scale and continental scale analysis*
- *Stakeholder interaction at the international scale*
- *New interactive tool for optimizing forest management*
  - *At different spatial scales*
  - *Simultaneous optimum for constraints and objectives*
  - *Flexibility for different circumstances*

```
                          "min", "sum", "areaWeightedSum"],
  # plots with high Shann - maximize
  "ShannonIncrease":["MAxMin Shanon in plots with larger dbh (not decrease)",
                     "Relative_Sha_highclassdbh_Tot_Nor",
                     "max", "min","sum"] ,
}
```



Unexpected peculiarities / barriers

COVID19-pandemia

- *MultiForest went online*
- *Mobility among partners limited*
- *Unused mobility funding was used to get more services from FinnOpt Ltd*

FinnOpt Ltd. was merged to a larger company, SILO.AI, in 2021

- *Required reorganizing the final steps of MultiForest*

Kick-off meeting in Jyväskylä, 2019

Final meeting in Ruhpolding, 2022

Thank you!

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ForestValue

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