

Project *brief*

Thünen Institute of Forestry

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Effectiveness of climate protection in forestry

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- The “Climate-adapted Forest management” (CAFM) funding program shows different climate protection effects and opportunity costs in forest enterprises: In addition to climate-effective measures, it also promotes less effective measures.
- The CAFM program criteria “No clear cuts after calamities”, “Coarse wood debris enrichment”, “Habitat tree preservation”, and “5% set-aside area” show high carbon storage with high opportunity costs.

Background and objectives

Our research objective was to analyze the opportunity costs and climate protection effects of the funding program “Climate-adapted Forest management” (CAFM), within the project “Incentive effects, acceptance, and climate effectiveness of different remuneration options for climate protection in forestry” (AnAKHon).

Ambitious climate protection targets have been formulated for the German land-use sector (e.g., the Climate Protection Act). Forests play a key role in this context, with forestry measures supported by government funding programs (e.g., the CAFM program). The effectiveness of the supported climate protection measures is therefore of great importance.

Approach

The implementation of the twelve criteria of the CAFM program was simulated in the long term using our “Forest Economic Simulation Model” (FESIM). For this purpose, we analyzed three forest enterprise types based on data from the Forest Accountancy Data Network of the Federal Ministry of Agriculture, Food, and Regional Identity.

Results

The effect of the CAFM program on opportunity costs and carbon storage varies wildly, depending on the initial situation of the forest enterprises, and changes over time. The CAFM program criteria C 6 “No clear cuts after calamities”, C 7 “Coarse wood debris enrichment”, C 8 “Habitat tree preservation”, and C 12 “5% set-aside area” exhibit comparatively high carbon storage but high opportunity costs. The criterion C 11 “Rewetting” proves to be expensive in the forest and can even reduce the carbon storage in the wood

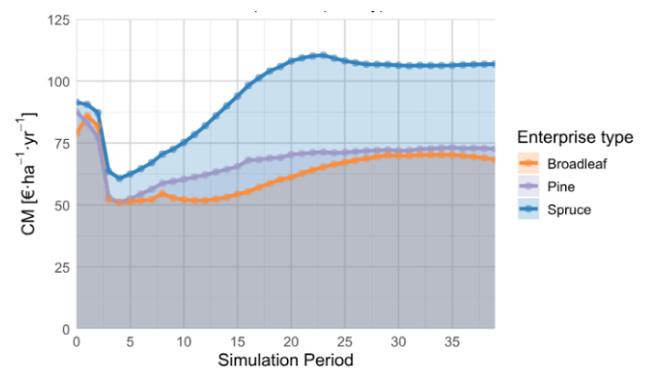


Figure 1: Opportunity costs of the “Climate-adapted Forest management” funding program for three forest enterprise types over the 200-year projection (one simulation period = five years) - (Source: own illustration).

stock. Fig. 1 shows the opportunity costs of the twelve CAFM criteria for three forest enterprise types over time. Opportunity costs are measured as annual loss in contribution margin (CM) per hectare in raw wood production. The costs are highest for the high-yield spruce-dominated enterprise group and lowest for the broadleaf-dominated enterprise group. Fluctuations result from the temporal effect of the twelve CAFM criteria.

Conclusions

Various effective measures are available to strengthen climate protection in German commercial forests. However, it seems impossible to achieve the sector targets of the German Climate Protection Act for the land-use sector through forest measures alone.

Further information

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Publications

Brinkord M, Regelmann C, Seintsch B (under Review): Quantifying the Opportunity Costs and Additional CO₂ Sequestration: Potential of a Climate Adaptation Program in Central European Forest Enterprises.

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