C.A.F.E. | Carbon, Aqua, Fire & Eco-resilience Decision Support System



C.A.F.E. determines the optimum silvicultural activities to manage multiple products, goods and services such as biomass production, C2 sequestration, fire risk, water provisioning , climatic resilience or biodiversity, for a selected solution.

This tool determines the optimum silvicultural activities to manage multiple products, goods and services such as biomass production, CO2 sequestration, fire risk, water provisioning, climatic resilience or biodiversity, which are simultaneously quantified in time and space for a selected solution. Main advantages include:

- Changing the mono-objective approach in order to include a group of ecosystem goods and services.
- Improving the economic performance of low productive areas by quantifying and valorising other resources that could be remunerated attending to the environmental value.
- Holistic optimization of multiple goods and services out of forest management.
- Adequacy to the specific characteristics of each site.
- Multi-scalar results (plot, forest working unit, catchment, etc.).

C.A.F.E. is a tool that combines eco-hydrologic dynamic simulation with many-criteria optimization, where the user can carry out forest management according to more than one product at the same time, and choose the relevance of each objective/product. This software is capable of working under different climatic regions thanks to the previous calibration of the eco-hydrological simulation. Furthermore, it is possible to modify the spatial scale moving from plot to catchment, integrating a strong biophysical unit. In the same way, simulating different climatic scenarios is also possible. The result is a group of possible solutions among which forest manager can decide and apply.

DéTAILS

ORIGINE DU BOIS

Forêt

TYPE DE BOIS

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TYPE DE BOIS CONCERNé

All wood produced in the forest system (trunk, branches, roots).

IMPACT SUR L'ENVIRONNEMENT ET LA BIODIVERSITé

- Demonstration and replication of a successful, innovative forest management scheme at a watershed scale. At the beginning it will be applied at sub catchment level in Spain (415 hectares), then at catchment level in Germany, Portugal and Spain (7,824 hectares) and finally it will be further expanded up to 350,000 hectares within five years from the project completion.
- Reinforcement of mechanisms to develop climate change adaptation measures in rural areas and to ensure its socioeconomic sustainability;
- Increased water reserves of 45-200 l/m²/year and increased water availability downstream, leading to a reduction in energy extraction costs to 5 W/hm;
- Increased sustainable biomass production for bioenergy uses, between 10 and 15 t/ha year, including both forest and

POTENTIEL DE MOBILISATION

Very positive

POTENTIEL DE DURABILITé - VALEUR

Très positif

FACILITé D'IMPLéMENTATION

It is not easy to use, but we are developing user guides to make it easier.

FACILITé D'IMPLéMENTATION - ÉVALUATION

Moyen

agricultural residues traditionally burned and usually the cause of wildfires.

- Reduced fire hazards by 30%, protecting rural populations currently residing in risk areas
- Increased resilience of 25% of forest areas to withstand droughts, pests and disease outbreak.

EFFET SUR LE REVENU

If the management objective is to maximise productivity, revenues will also be maximised.

PRéREQUIS CLéS

Input data for the chosen mechanistic model.

Decision variables.

Constraints to be applied.

POTENTIEL D'EXPLOITATION

High, as it is based on mechanistic modelling it can be applied in any climatic region. Furthermore, by including a wide range of ecosystem services, it can meet the needs of different types of forest management.

TYPE D'éVéNEMENT Où CETTE ICPE A éTé PRéSENTéE

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HUB

Pôle Sud-Ouest

EFFET SUR L'EMPLOI

The management that is proposed always generates jobs to carry it out.

IMPACT éCONOMIQUE

The tool is free, so the economic impact is positive as you provide a very powerful management tool at 0 cost.

COûTS D'IMPLéMENTATION (EURO - €)

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CONNAISSANCES SPéCIFIQUES REQUISES

Knowledge of Geographic Information Systems is necessary to be able to prepare the input data for the tool.

PLUS DE DéTAILS

DéFI CONCERNé

1. Améliorer la résilience de la forêt et son adaptation au changement climatique

DOMAINE

Getsion forestière, sylviculture, services écosystémiques, résilience

Perturbations forestières, risque, réponse aux calamités

TYPE DE SOLUTION

Modélisation, DSS, simulation, optimisation

MOTS-CLéS

Resilience/Networking/Decision support system(DSS)/

SOLUTION DIGITALE

Oui

INNOVATION

Oui

PAYS D'ORIGINE

Belgique

ECHELLE D'APPLICATION

Continentale

DéBUT ET FIN D'ANNéE

2019 - 2023

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REFERENCES AND RESOURCES

SITE WEB PRINCIPAL

http://www.resilientforest.eu/wp-content/uploads/2020/05/DSS-TOOL-.pdf

SITE WEB DU PROJET

https://www.resilientforest.eu/

RéFéRENCE DU PROJET

The project LIFE RESILIENT FORESTS – Coupling water, fire and climate

RESSOURCES

resilience with biomass production from forestry to adapt watersheds to climate change is co-funded by the LIFE Programme of the European Union under contract number LIFE 17 CCA/ES/000063

LOGO DE LA BONNE PRATIQUE

LOGO DE L'ORGANISATION PRINCIPALE

PROJET SOUS LEQUEL CETTE FICHE D'INFORMATION A éTé CRééE

Rosewood 4.0

DATE DE PUBLICATION

8 sep 2021

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 862681

A TOOL FROM ROSEWOOD 4.0, DESIGNED AND DEVELOPED BY