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.

DETALLES

ORIGEN DE LA MADERA

Bosque

TIPO DE MADERA

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TIPO DE MADERA AFECTADA

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

IMPACTO EN EL MEDIO AMBIENTE Y LA BIODIVERSIDAD

- 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

POTENCIAL DE MOVILIZACIóN

Very positive

POTENCIAL DE SOSTENIBILIDAD - VALOR

Muy positivo

FACILIDAD DE APLICACIóN

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

FACILIDAD DE IMPLEMENTACIóN - EVALUACIóN

Medio

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.

EFECTO SOBRE LOS INGRESOS

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

PREREQUISITOS CLAVE

Input data for the chosen mechanistic model.

Decision variables.

Constraints to be applied.

POTENCIAL DE EXPLOTACIóN

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.

TIPO DE EVENTO EN EL QUE SE HA PRESENTADO ESTA IFS

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HUB

Centro del Suroeste

EFECTO SOBRE EL EMPLEO

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

IMPACTO ECONóMICO

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

COSTES DE IMPLEMENTACIóN (EURO - €)

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CONOCIMIENTOS ESPECíFICOS NECESARIOS

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

MáS DETALLES

RETO ABORDADO

1. Mejorar la resistencia y la adaptación de los bosques al cambio climático

DOMINIO

Gestión forestal, silvicultura, servicios ecosistémicos, resiliencia

Perturbaciones forestales, riesgos, respuesta a desastres

TIPO DE SOLUCIóN

Modelización, DSS, simulación, optimización

PALABRAS CLAVE

Resilience/Networking/Decision support system(DSS)/

SOLUCIóN DIGITAL

Sí

INNOVACIóN

Si

PAíS DE ORIGEN

Bélgica

ESCALA DE APLICACIóN

Continental

AñO DE INICIO Y FIN

2019 - 2023

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REFERENCES AND RESOURCES

SITIO WEB PRINCIPAL

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

SITIO WEB DEL PROYECTO

https://www.resilientforest.eu/

REFERENCIA DEL PROYECTO

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

RECURSOS

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 BUENA PRáCTICA

LOGOTIPO DE LA ORGANIZACIóN PRINCIPAL

PROYECTO BAJO EL QUE SE HA CREADO ESTA FICHA

Rosewood 4.0

FECHA DE MENSAJE

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A TOOL FROM ROSEWOOD 4.0, DESIGNED AND DEVELOPED BY