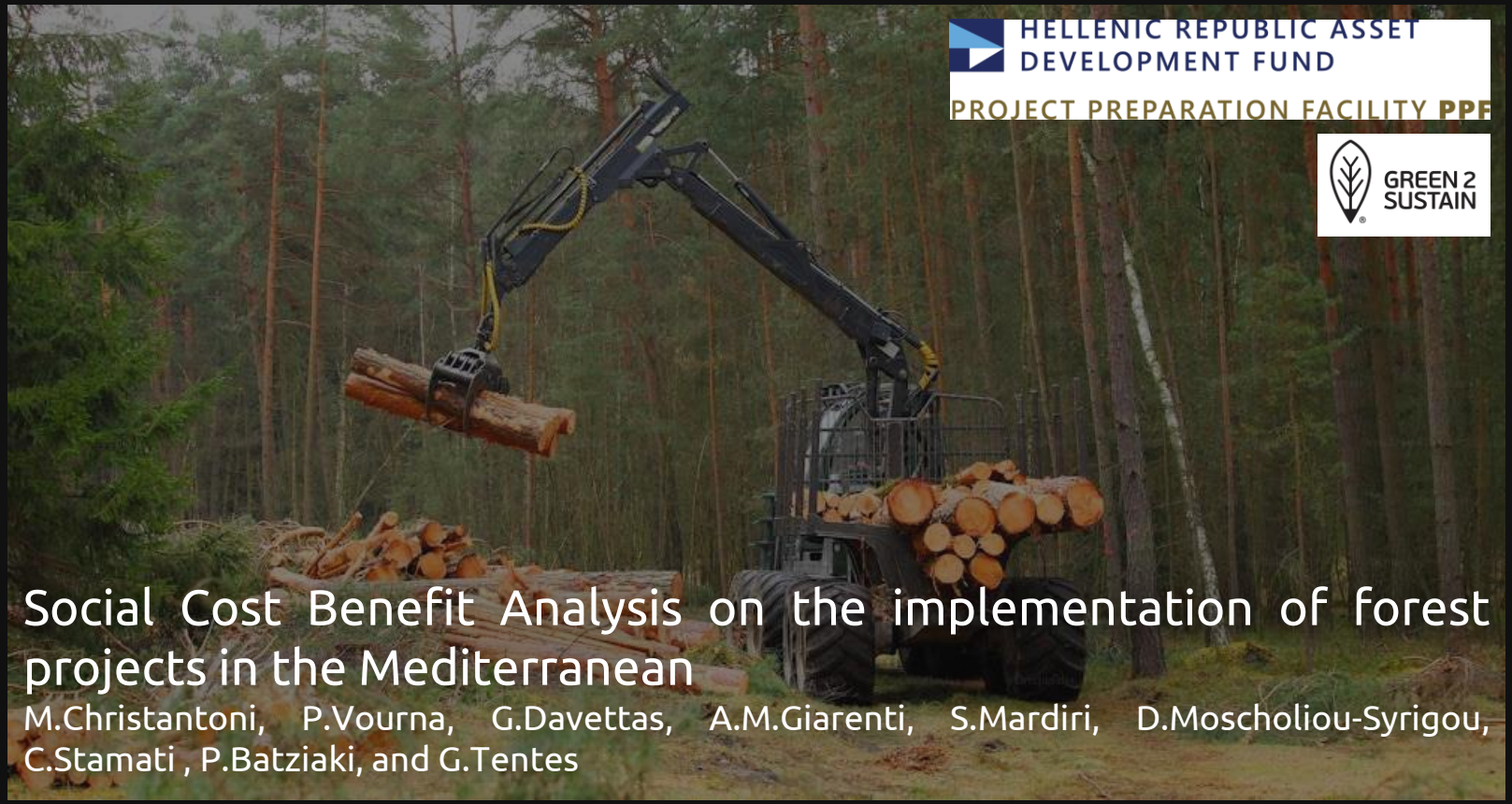
11th International Conference on Environmental Management, Engineering, Planning and Economics (CEMEPE 2024) & SECOTOX Conference



HELLENIC REPUBLIC ASSET DEVELOPMENT FUND

PROJECT PREPARATION FACILITY PPF

GREEN 2 SUSTAIN

Social Cost Benefit Analysis on the implementation of forest projects in the Mediterranean

M.Christantoni, P.Vourna, G.Davettas, A.M.Giarenti, S.Mardiri, D.Moscholiou-Syrigou, C.Stamati , P.Batziaki, and G.Tentes

Contents

Introduction

FOREST PROTECTION PLAN | *ANTINERO*

Ministry of Environment and Energy

Hellenic Republic Asset Development Fund
Project Preparation Facility

The program

- Forest and woodland clearings
- Maintenance of forest roads
- Maintenance of fire protection zones
- National Recovery and Resilience Plan "Greece 2.0."
- Supported by the Next Generation EU Fund

Greece 2.0
NATIONAL RECOVERY AND RESILIENCE PLAN

Funded by the European Union
NextGenerationEU

Forestry works →
Option agreements for biomass utilisation

Biomass management in all regions involved.

Objective → assess and provide strategies for the effective management of biomass (wood & leaf biomass)

Optional Scope:
Cost adjustment based on actual quantities and unit prices

Logistics and Implementation
- Detailed plan for biomass transport and management
- Compliance with specific obligations and technical specifications
- Detailed costing of works and environmental management of biomass
- Proposals for distribution scheme

Materials & methods

Literature review

- Investigation on the social value.
- Estimation of the current value of goods.
- Secondary data analysis.

Total Economic Value

- Cumulative value of individual services.
- Estimation of all services at once

Social cost-benefit analysis (CBA)

- Analysis of the socio-economic conditions of the environmental benefits deriving by forestry operations in Greece, etc.

Literature review on the social values of forests

Current value of goods and services

- Carbon sequestration
- Natural hazards protection
- Timber
- Firewood
- Tourism and recreation
- Biomass capacity to meet energy needs
- Willingness of citizens to pay for each additional kg of CO_2 reduced

- Average pellet price
- CO_2 emissions reduction
- Generation of employment opportunities
- Permanent employment positions

- **Overall economic valuation of forests (per ha)**

Economic valuation of services

Employing both the total value approach through the summation of individual services and the total value approach in isolation a representative value was selected for each benefits' category, and the current price of services and goods was calculated.

Service	Unit price	Measurement unit	Calculation scale	Calculation basis	Quantity	Value (€/y)
carbon sequestration	€ 27.45	€/ha/y	Area of operation	Land area (ha)	12,160	€ 333,818
protection against natural hazards	€ 654.79	€/ha/y	Area of operation	Land area (ha)	12,160	€ 7,962,172
timber	€ 44.74	€/ha/y	Area of operation	Land area (ha)	3,138	€ 140,380
covering energy needs from biomass	€ 25.11	€/ha/y	Area of operation	Land area (ha)	12,160	€ 305,381
recreational tourism	€ 118.96	€/ha/y	Area of operation	Land area (ha)	12,160	€ 1,446,544
pellet fuel	€ 289.47	€/t/y	Area of operation	Quantity (t)	1,175	€ 340,073
shredded biomass	€ 434.40	€/t/y	Area of operation	Quantity (t)	1,175	€ 510,334
biodiversity and wildlife	€ 12.79	€/vis/y	Municipalities of operation	Annual visits	17,900,842	€ 229,014
improvement of surface water quality	€ 105.09	€/hh/y	Municipalities of operation	Households	1,243,114	€ 130,638
Hunting	€ 98.69	€/vis/y	Municipalities of operation	Households	1,243,114	€ 16,358
natural landscape (minimum)	€ 16.45	€/hh/y	Municipalities of operation	Population	3,353,330	€ 55,158
natural landscape (maximum)	€ 90.47	€/hh/y	Municipalities of operation	Population	3,353,330	€ 303,370
groundwater recharge	€ 47.12	€/hh/y	Municipalities of operation	Population	1,243,114	€ 58,576
TOTAL 1 (all services with pellet and minimum landscape value)						€ 500,274
TOTAL 1a (all services with crushed biomass and minimum landscape value)						€ 500,444,169
TOTAL 2 (all services without shredded biomass or pellets and maximum landscape value)						€ 803,304,066
Total value (Περ.Α)	€ 1,571.07	€/ha/y	Area of operation	Land area (ha)	12,160	€ 19,104,043
Total value (Περ.Β)	€ 90.47	€/hh/y	Municipalities of operation	Population	3,353,330	€ 303,370,232

Detailed calculations of services and values for forest areas
(Source & Estimation: GREEN2SUSTAIN, 2023)

Cost estimation & social analysis

Cost estimation

Mainly as operating costs with a total budget of nearly € 32 M.

Social analysis calculations

- Annual income of a job position → to € 28K (at 2022 prices)
- Each of the 20 sub-projects → 59 job positions
  → estimated that about 30% are new
- The number of employment positions will increase every five years.

Cost estimation & social analysis

Turnover, from job positions created, during the four months of project implementation, in nominal terms.
(Source & Estimation: GREEN2SUSTAIN, 2023)

Job positions	Turnover
Direct job positions:	8.251.751 €
Indirect job positions:	30.082.858 €
Induced job positions:	22.235.156 €
Total:	60.569.767 €

The total benefit to the local community in terms of nominal values is (expressed in 2022 prices): 325,281,106 €.

Total Cost - Benefits

Costs, benefits and total social CBA for a 10-year period in NPV terms. (Source & Estimation: GREEN2SUSTAIN, 2023)

Benefits	
Decade period (NPV)	1,970 M€
Quadrennial period (NPV)	1,030 M€
Costs	
Decade period (NPV)	- 188.2 M€
Quadrennial period (NPV)	- 97.5 M€
Total Benefit	
Decade period (NPV)	1,780 M€
Quadrennial period (NPV)	933 M€

Conclusions

Positive aspects

- Total Value of forest assets is 300 - 500 M€.
- Total Value with the method of direct valuation at 303 M€.
- Value of landscape, biodiversity and wildlife cumulatively may exceed 50% of the Total Value.
- Forest as a commodity.

Methodology limitations

- Survey is not geographically limited.
- Not possible to establish the actual number of new job positions per project.
- Not possible to quality check the results of the surveys of third-party researchers.

Social CBA benefits

- Direct and indirect benefits to the local and wider economy → total net present value of €1,805 million (or €950 million in 4 years).
- The total costs from forestry projects →total net present value of €63 million.

Conclusions

- Significant benefit for municipalities and local communities, continuous over time, as the goods and services provided do not change over time.
- Costs are very low, even for the first year of operation, due to zero capital cost.
- With a medium or even a large investment, Greece can gain remarkable socio-economic benefits guaranteed for many years into the future, both for residents and the local and broader community economy.
- The findings of this study are indicative of social effects in local communities, and it is also indicative of potential similar effects in countries of the Mediterranean, or countries implementing similar forestry operations.

Future Directions Initiatives leading to a Sustainable Forestry

On going:

- ✓ Creation and operation of a registry of accredited buyers of forest biomass, with sustainability criteria in terms of resource management (bioenergy, pellets, etc.).
- ✓ Execution of bidding auctions for the utilization of biomass in order tp refund green actions, through the “Green Fund“.
- ✓ Completion of management studies for major Greek forest Ecosystems, in Attica, Peloponnese and Voiotia, which include biomass utilization.
  - ✓ Assessment and mitigation of climate crisis impacts on forest ecosystems
  - ✓ Interconnection of management studies with Fire Prevention Plans – Studies, AntiNero projects, in the context of forest fire prevention

Next Steps:

- ➢ Preparation of management studies in the rest of the country.
- ➢ Involvement of independent bodies in the sustainability certification of the forest biomass that will be removed based on management studies.

THANK YOU!

Do you have any questions?

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