



FOREST EUROPE
Expert Group Meeting
Workstream 3
Green Jobs and Forest Education



2nd Expert Group Meeting on Green Jobs
7-9 June, Stockholm

Forest Ecosystem Services provision and green jobs development

Davide Pettenella and Mauro Masiero




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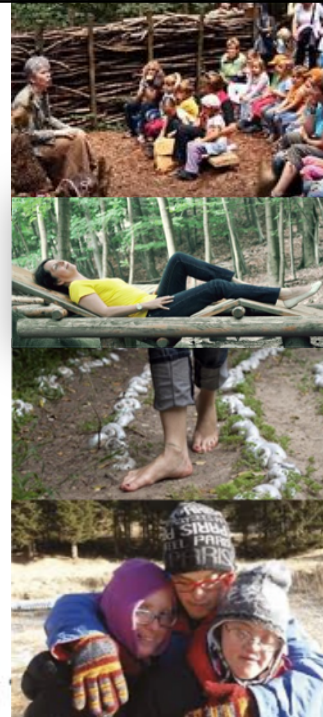
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- Trends in ES provision and related impacts on forest labour market
- The policy framework
- Marketing cultural ES associated to green jobs
- Concluding remarks

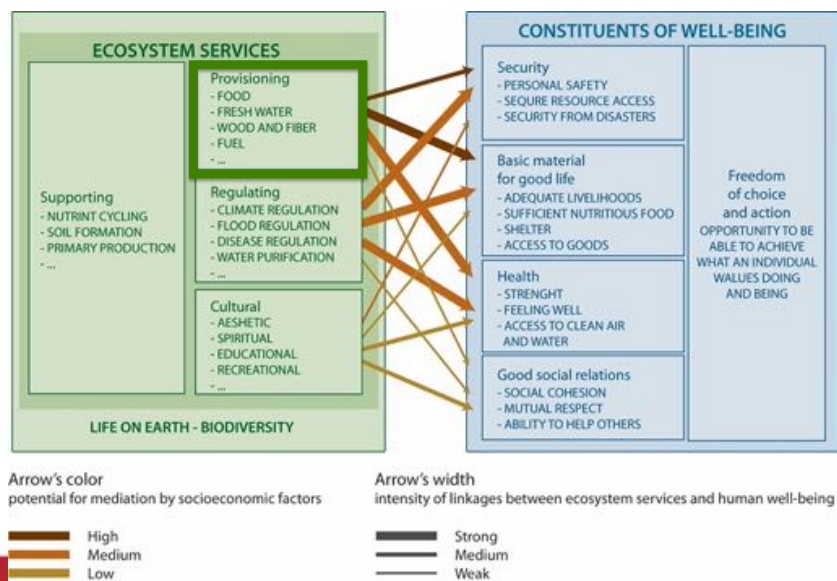
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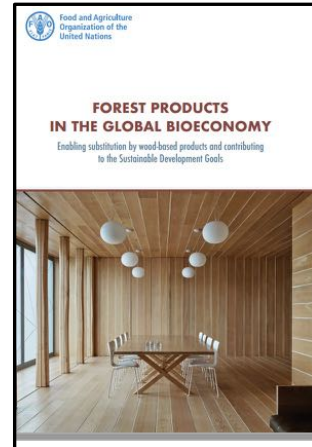
Ecosystem Services (ES) classification (MA, 2005)



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Bioeconomy development: new products

→ Impacts on the
forest-related labour
market?



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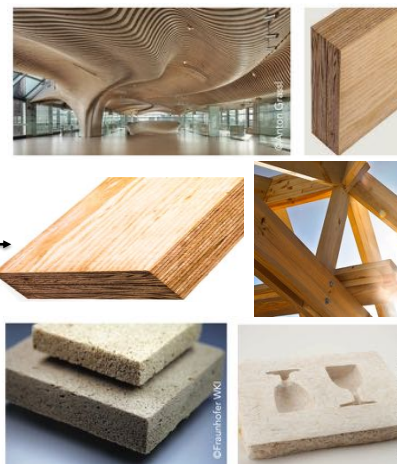
5 strategic sectors (FAO, 2021) (for fossil product substitution)

- Engineered wood products

Cross-Laminated Timber (CLT or X-LAM): +37% annual growth (2014-20)

Laminated Veneer Lumber (LVL): +6% annual growth

- Foams and wood insulation



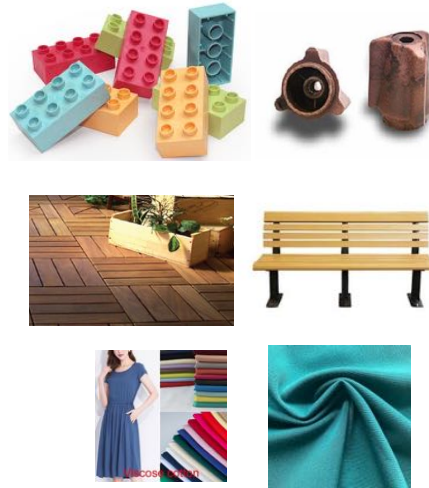
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5 strategic sectors

- Bio-plastics
- Wood-based composites (e.g., : PWC- *Plastic-Wood Composite*)
- Bio-textile products



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5 strategic sectors

Building sector (← New Bauhaus initiative)

- Engineered wood products
- Foams and wood insulation
- Bio-plastics
- Wood-based composites
- Bio-textile products

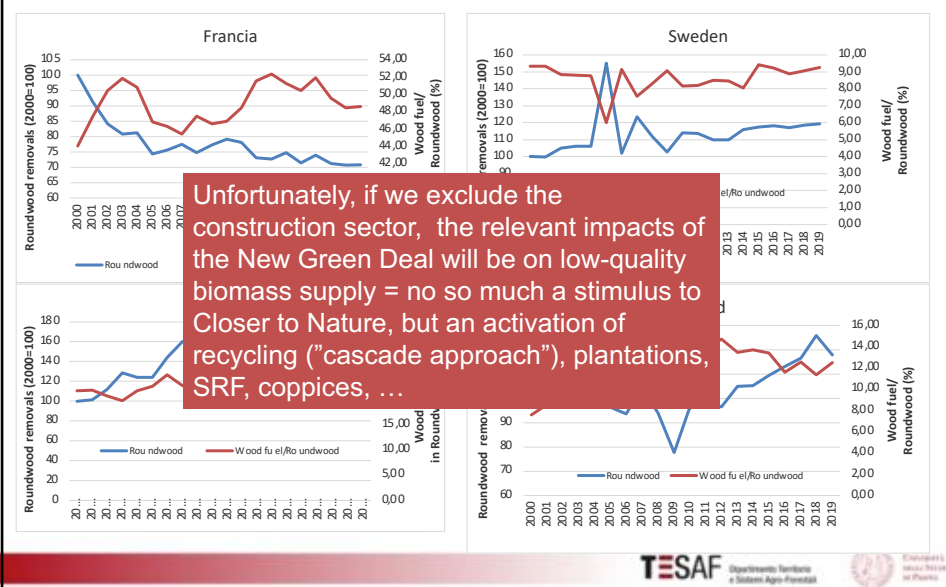
From low-quality wood biomass

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A common trend around Europe: an increase of low-value wood removals



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Bioeconomy: a strong emphasis on biorefineries

- A **key factor** in the transition to a bio-based economy will be the **development of biorefinery systems** (Scarlat *et al.*, 2015)
- Biotechnology and the biorefinery concept are **essential components** of the bioeconomy (McCormick and Kautto, 2013)
- The bioeconomy is integrating traditional agricultural, forest and marine biomass feedstock production systems with a **range of biorefinery options and applications** (SCAR, 2014)
- Biorefineries are increasingly **at the core** of the bioeconomy vision at the EU level and worldwide (World Bioeconomy Summit, 2015)

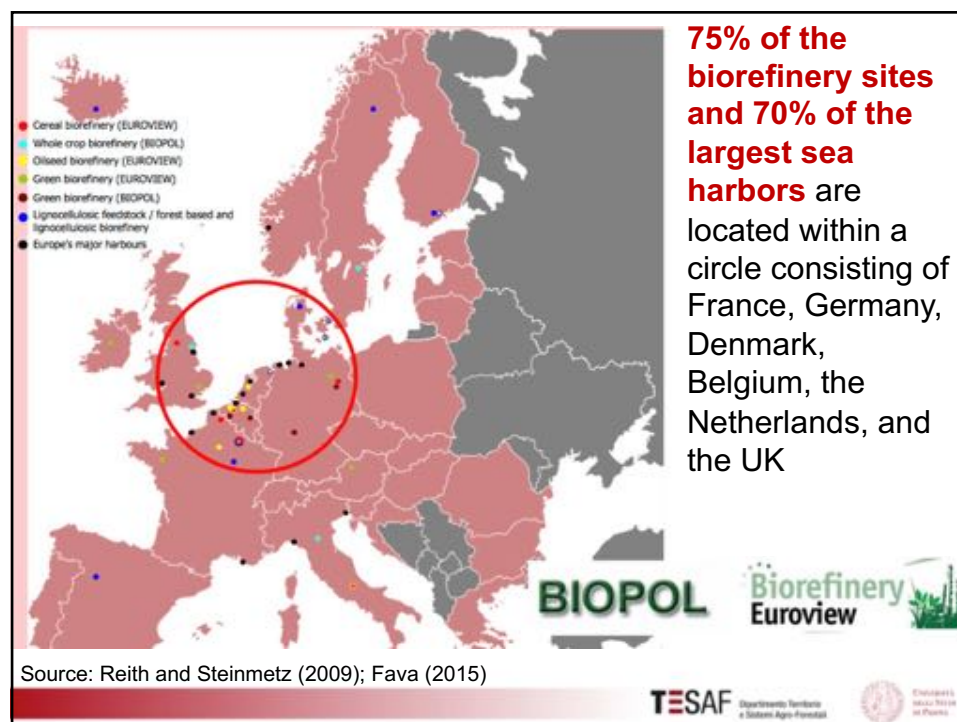
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2 large biorefinery models

(Europabio, 2011, European Commission, 2012, Ceapraz *et al.*, 2016)

- A. Port-biorefinery → strongly connected to global flows of raw materials**, key-logistic location (inside/nearby harbors, along channels...), high specialization, threshold effects, and economies of scale
- B. Territorial biorefinery → strongly connected to local/surrounding territory** and (in general terms) dependent on a more diverse and more thorough valuation of various biomasses

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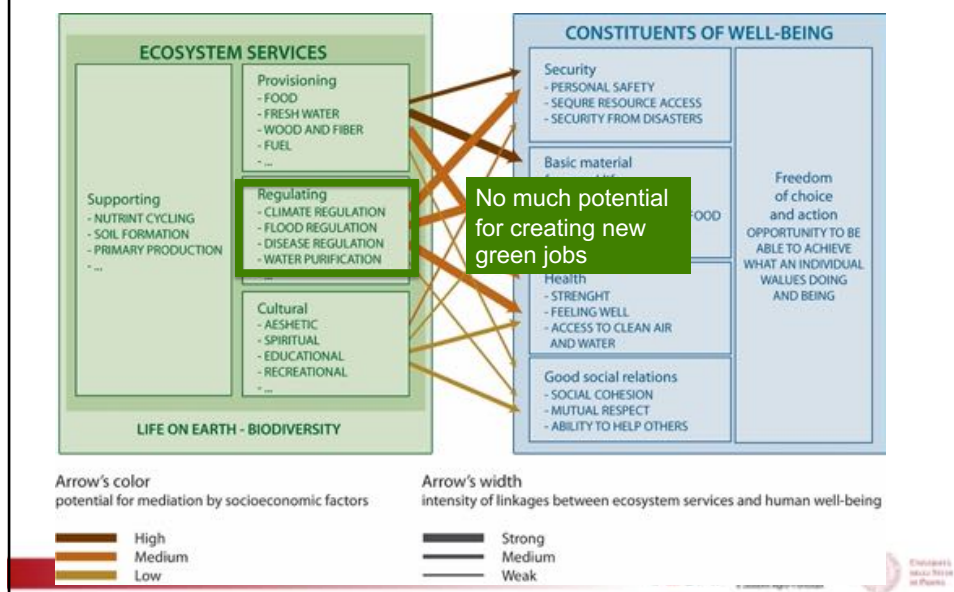
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An interesting case study



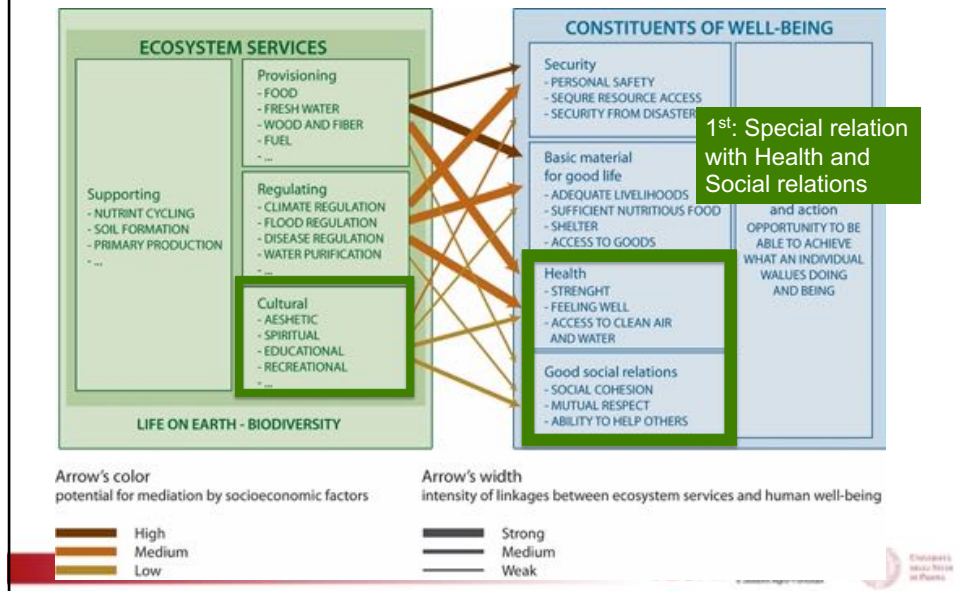
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Ecosystem Services (ES) classification (MA, 2005)



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Ecosystem Services (ES) classification (MA, 2005)



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The collage shows various ecosystem services and human activities:

- Spiritual services**: A group of people gathered around a large tree.
- Cultural services**: A large, ornate wooden structure, possibly a totem pole or a ceremonial structure.
- Educational services**: Two children in winter clothing sitting on a log.
- Recreation and tourism**: A person standing on a wooden platform high up in a large tree.
- Sport activities**: A person running on a dirt path in a forest.
- Social inclusion**: A group of people, including children, sitting together outdoors.
- Wellness and therapeutic services**: A person's feet standing on a path made of small stones.

Cultural FES have a special economic feature?

Logos at the bottom: **TESAF** (Departamento Territorio e Sistema Agro-Forestal) and **Encuentro de Saberes y Prácticas**.

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“Cultural” ES (better “Socio-cultural” ES)

- **Cultural** services (art museums, concerts in the forest, theatre performances ...)
- **Educational** and pedagogic services (kindergarten or outdoor nursery forest schools, food forests, nature trails, bird watching, training in the forest, ...)
- **Sport** services (hunting, hiking, Nordic walking, running, mountain biking, orienteering, airsoft, archery, use of adventure parks,...)
- **Spiritual** and religious services (places for meditation and worship, ecological burial, funeral forests)
- **Tourism and recreation** (walking, visits to special landscapes, sites and natural monuments, wild forest products picking, camping, tree houses, ...)
- Services for **social inclusion** (activities for the elderly, the handicapped, prisoners, refugees-displaced persons, ...)
- Services for improving **wellness** and for **therapeutic treatments** (forest bathing-Shinrin-Yoku, forest therapy, pet therapy, ...)

«Green care» («Forest care»)

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“Social forestry”



Training and job-opportunities for fragile persons:
unemployed people at high risk of social exclusion,
e.g. immigrants, people with with addiction or
mental disorders...

<http://socialforest.org/en/>

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«Green care»

Green Care is an emerging concept referring to the “*range of activities that promotes physical and mental health and well-being through contact with nature*”

(Sempik *et al.*, 2010, p.121).

A simplified view of FES economy

Ecosystem Services

- *Provisioning*
- *Regulating*
- *Socio-Cultural*

Nature of the goods (excludability, rivalry)

- Mainly private goods (wood)
- Mainly public goods (biodiversity)
- Mixed public-private goods (NWFP picking, forest bathing)

A simplified view of FES economy

Ecosystem Services	Institutions, drivers	Prevailing tools for improving demand/supply relationships
• <i>Provisioning</i>	• Market	• prices under the free market economy
• <i>Regulating</i>	• State	• compensations, incentives, (eco)taxes, ...
• <i>Socio-Cultural</i>	• Community	• technical assistance, people engagement, local authorities' animation, entrepreneurial support, ...

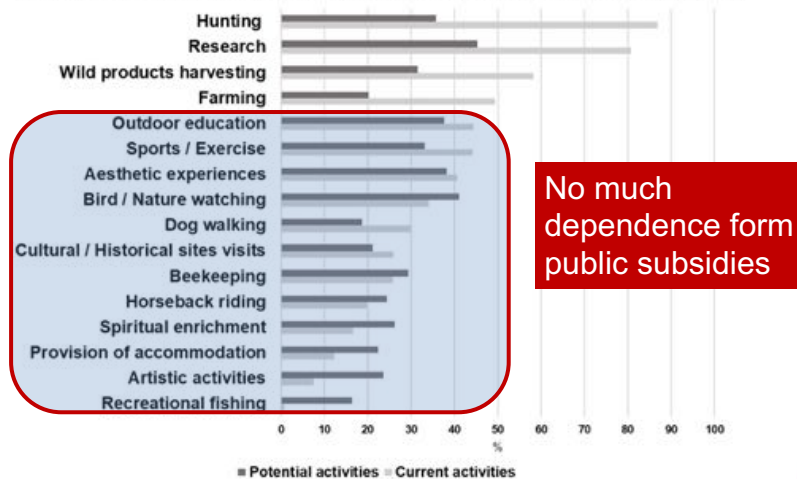
A simplified view of FES economy

Ecosystem Services	Institutions, drivers	Economic theory
• <i>Provisioning</i>	• Market	• neoclassical economics
• <i>Regulating</i>	• State	• environmental economics; neo-institutional economics
• <i>Socio-Cultural</i>	• Community	• social economics, experience economics

Social economics is a branch of economics and a social science that focuses on the relationship between social behaviour and economics, covering such issues as social capital, gender, ethics, and philanthropic behaviour.

Could the site/area that you manage deliver any more of these activities if you received additional incentives?

Fig. 2. Percentage of respondents indicating current and potential cultural ecosystem services (CES).



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Associated to the growing role of socio-cultural FES, a relevant changes in the management of forest resources: a **gender revolution**

"The first and foremost purpose of a forest growth is to supply us with wood material; it is the substance of the trees itself, not their fruits, their beauty, their shade, their shelter, that constitutes the primary object..."

B.E. Fernow, 1902.
Economics of Forestry (p. 86)

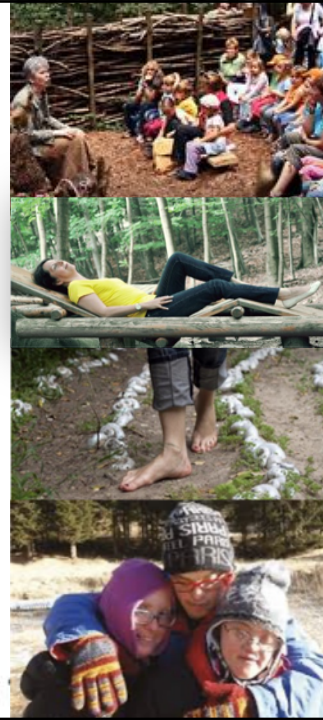


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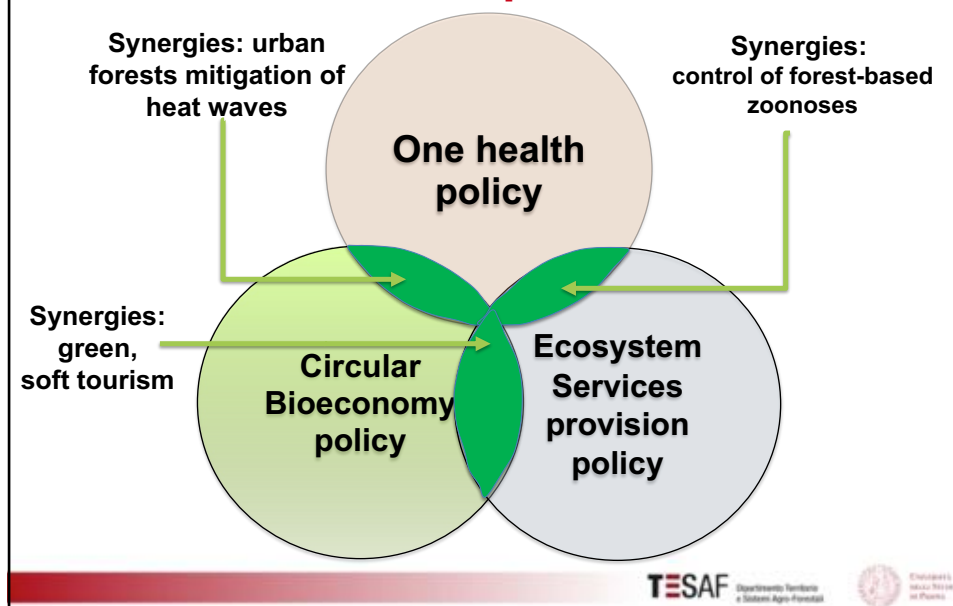
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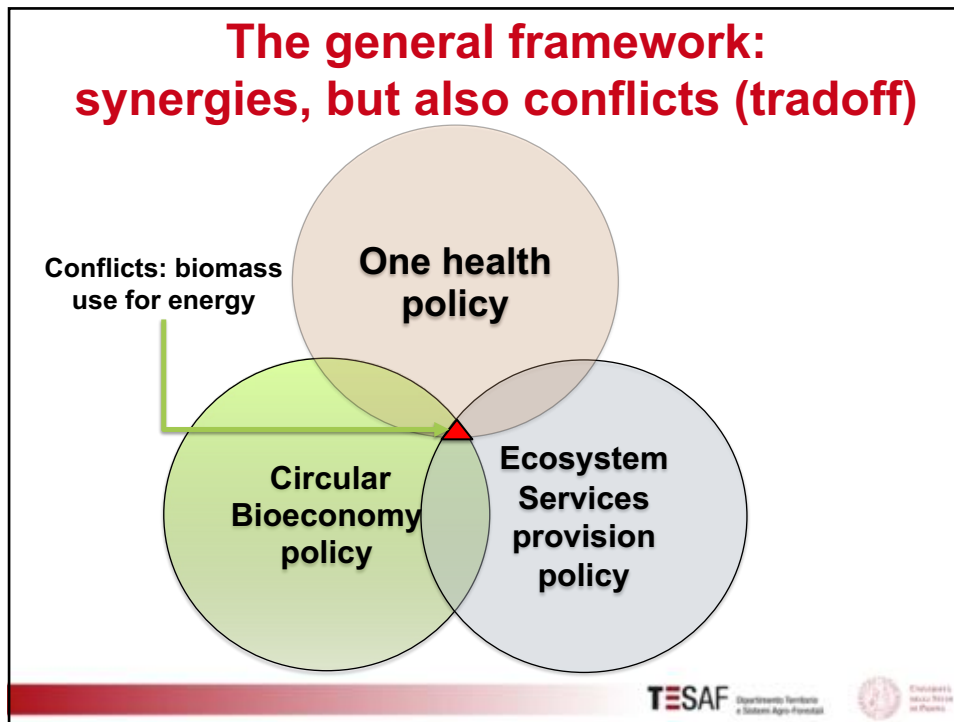


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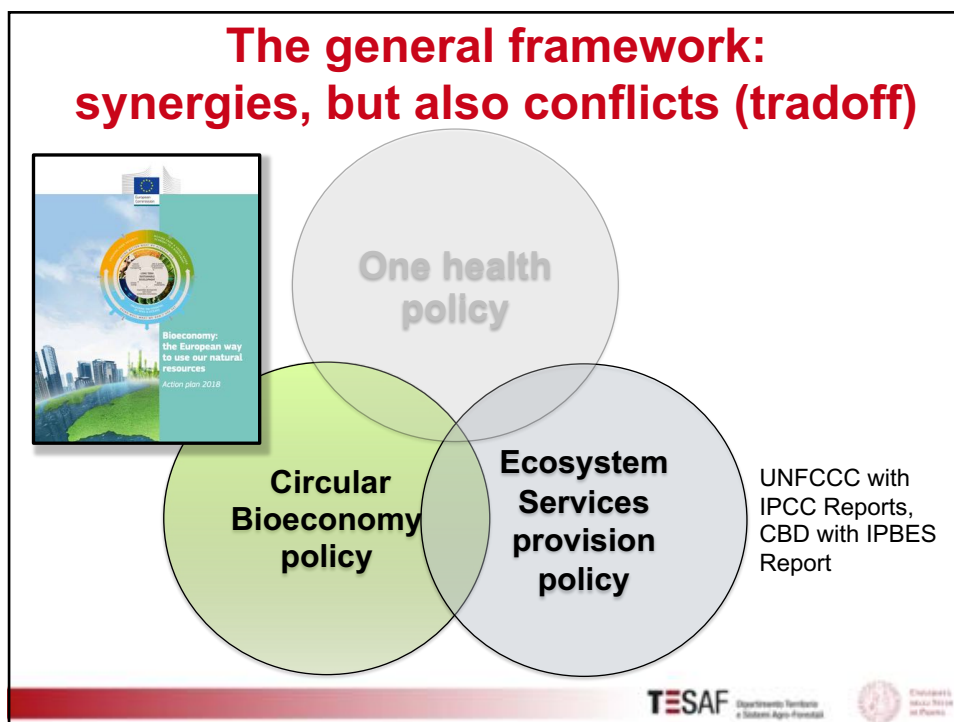
The general framework: 3 dominant policies



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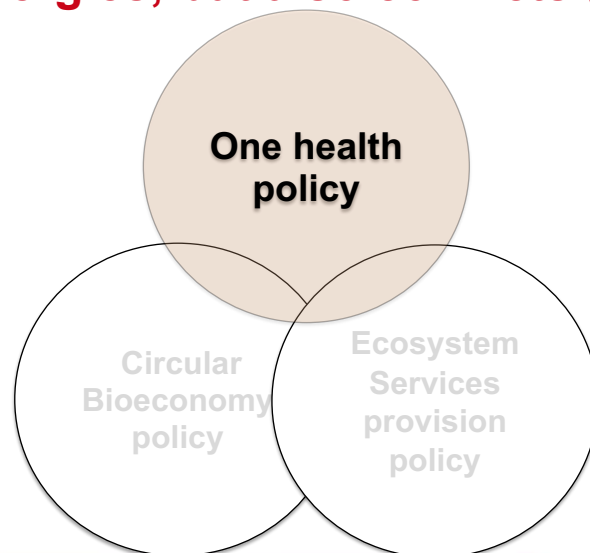


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The general framework: synergies, but also conflicts (tradoff)



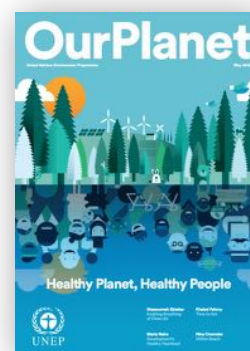
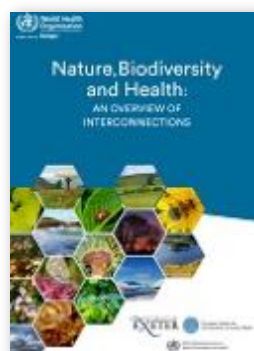
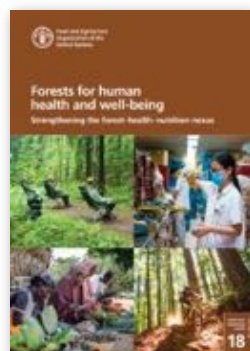
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One Health policy (WHO, FAO, OIE, UNICEF et al., 2008)

Human health is interdependent and bound to the health of the ecosystems → A growing attention to the relationship between environmental protection and human health



Source: <https://www.oie.int/>

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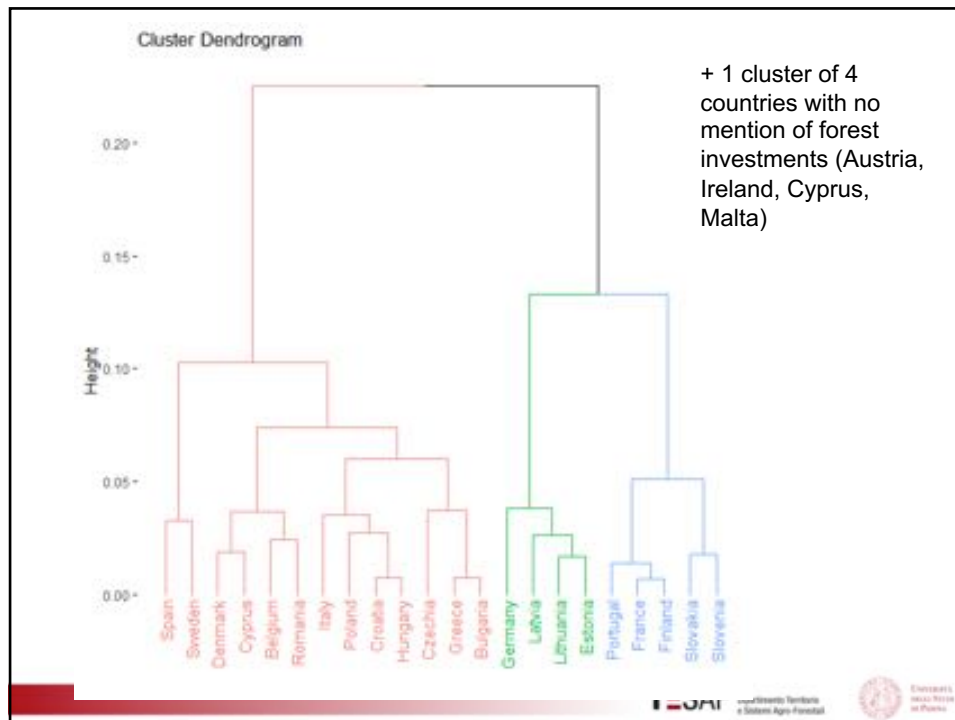
NRRPs: the role of the forest sector and of green jobs

	Circular bioeconomy	Green revolution/ ecological transition	Green jobs	Rural Development	Climate Adaptation/ natural hazard prevention	Climate Mitigation	Biodiversity	Sustainable Forestry	FES provision/ enhancement	Urban Nature-Based solution	Gender Balance and women inclusion	Innovation
Austria			X		X		X		X	X		
Belgium			X		X	X	X		X			
Bulgaria				X			X					
Croatia					X	X	X					
Cyprus					X	X	X					
Czechia		X		X	X	X	X	X	X			
Denmark						X	X			X		
Estonia	X	X				X						X
Finland	X				X	X	X	X	X			X
France	X			X	X	X	X	X	X			X
Germany	X		X			X		X				X
Greece			X	X	X		X		X			
Hungary				X	X		X					
Ireland												
Italy				X			X		X	X		X
Latvia		X			X							X
Lithuania	X											X
Luxembourg							X			X		
Malta												
Poland				X					X			
Portugal	X		X	X	X	X	X	X	X			X
Romania					X	X	X	X		X		
Slovakia	X	X	X		X	X	X	X	X	X		X
Slovenia	X		X		X	X	X	X	X			X
Spain				X	X		X	X	X		X	
Sweden		X					X		X		X	

Source: Bottaro, Liagre, Pettenella (in press)

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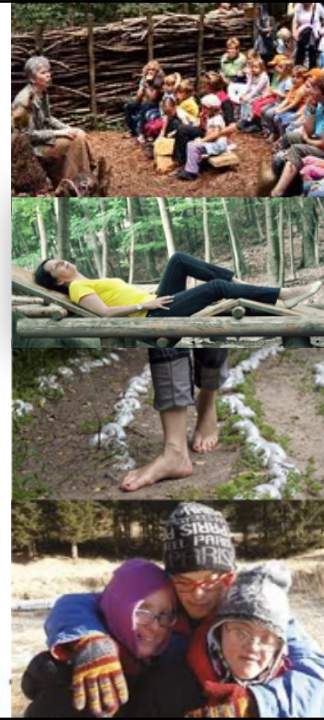
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1st cluster: focus on biodiversity, climate adaptation (no references to circular bioeconomy and ecological transition)

Country	CirBioec	EcoTrans	GI	RD	ClimAd	ClimMit	Biodiv	SF	PES	UNBS	GenderS	Innov
Belgium	0	0	1	0	1	0	1	0	1	1	0	0
Bulgaria	0	0	1	1	1	1	1	0	1	0	0	0
Croatia	0	0	1	0	0	0	1	0	0	0	0	0
Cyprus	0	0	0	0	1	1	1	0	0	0	0	0
Denmark	0	0	0	0	0	1	1	0	0	1	0	0
Greece	0	0	1	1	1	0	1	0	1	0	0	0
Hungary	0	0	0	1	1	0	1	0	0	0	0	0
Italy	0	0	0	1	0	0	1	0	1	1	0	1
Poland	0	0	0	1	0	0	0	0	1	0	0	0
Romania	0	0	0	0	1	0	1	1	0	1	0	0
Spain	0	0	1	1	0	0	1	1	1	0	1	0
Sweden	0	1	0	0	0	0	1	0	1	0	1	0
Estonia	1	1	0	0	0	1	0	0	0	0	0	1
Germany	1	0	1	0	0	1	0	1	0	0	0	1
Latvia	0	1	0	0	1	0	0	0	0	0	0	1
Lithuania	1	0	0	0	0	0	0	0	0	0	0	1
Czechia	0	1	0	1	1	1	1	1	1	0	0	0
Finland	1	0	0	0	1	1	1	1	1	0	0	1
France	1	0	0	1	1	1	1	1	1	0	0	1
Portugal	1	0	1	1	1	1	1	1	1	0	0	1
Slovakia	1	1	1	0	1	1	1	1	1	1	0	1
Slovenia	1	1	1	0	1	1	1	1	0	0	0	1

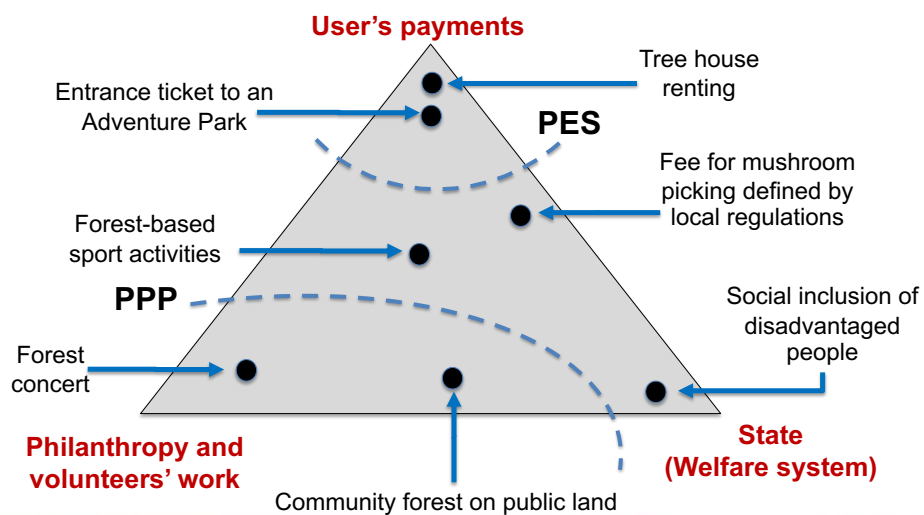
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Socio-cultural FES: payments' agents and coverage of costs of provision



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How to foster the provision of socio-cultural FES?

- By private actors
 - Service innovation

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Service innovation (Micotourism in Castilla y León - SP)



<http://www.turismocastillayleon.com/es/gastronomia-enoturismo/micoturismo>

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Service innovation (Dark Sky forest Park in Scotland – UK)



<https://forestryandland.gov.scot/visit/forest-parks/galloway-forest-park/dark-skies>

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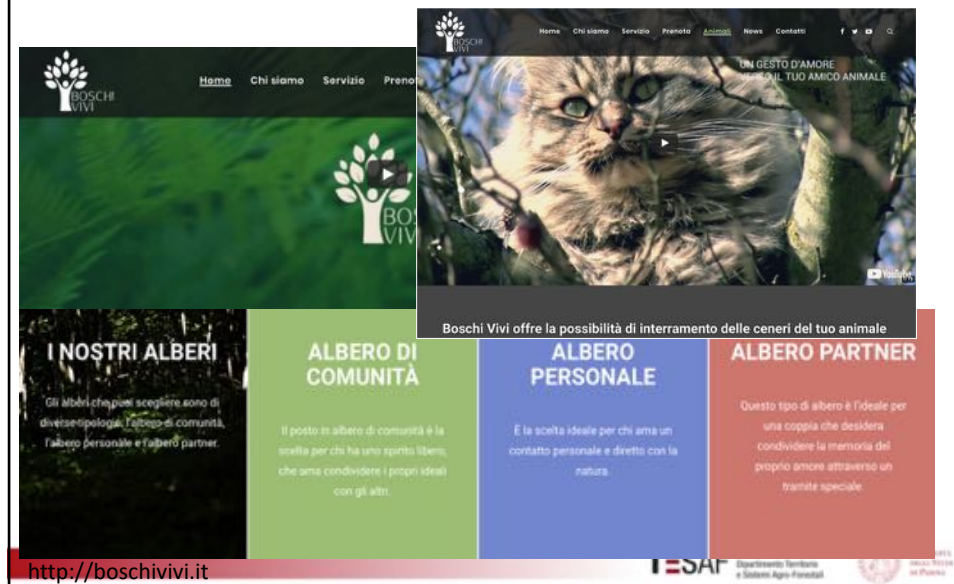
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Service innovation (Tree houses – all around dEurope)



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Service innovation (Burial forests for pets – Liguria Region . IT)



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Service innovation (Holzpark – Austria)



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Service innovation (World mushroom championship in Parma Province – IT)

<http://www.parcoappennino.it/campionato.mondiale.fungo/Eindex.php>

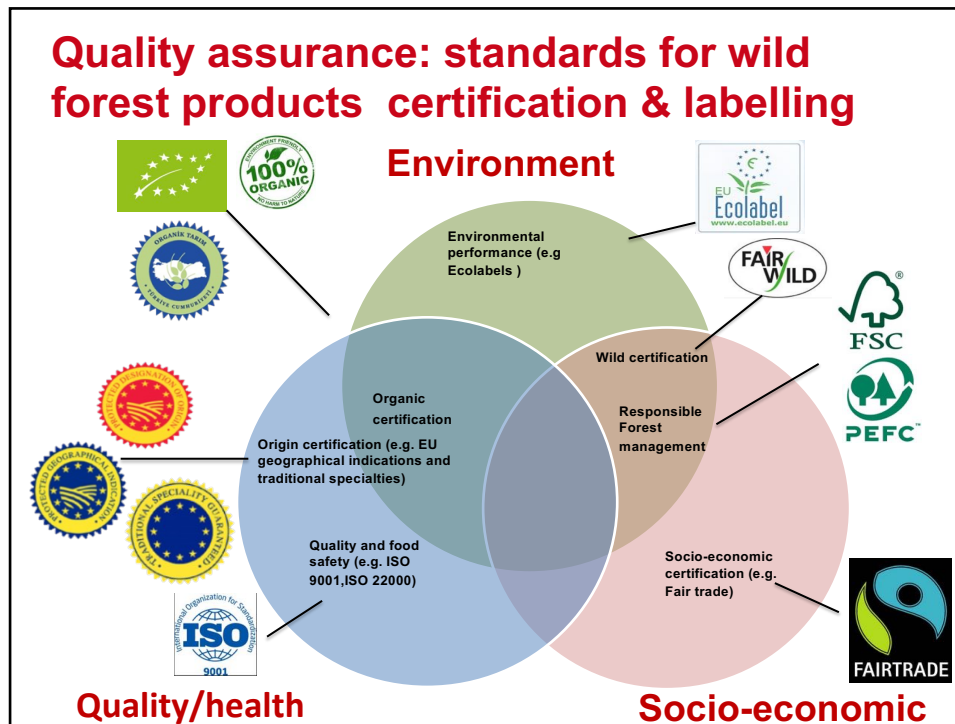


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How to foster the provision of socio-cultural FES?



- By private actors
 - Service innovation
 - Quality assurance: standards, certification & labelling

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Quality assurance: standards for FES certification & labelling









1st standard for forest and health and 1st certification case in 2021 in Italy





Since 2018 a specific standard for 5 ES



A standard for forest and health under development

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Quality assurance: standards for tourism certification & labelling

More than **50** schemes/initiatives:

- **Local/national** (very few international)
- **Single sectors** (e.g.: destinations, national parks)
- **One single issue** (e.g.: environmental impacts, protected areas areas)
- **Few third-party certification schemes**



→ Serious problems of overlapping of messages, effectiveness in communication, visibility, limited impacts

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How to foster the provision of socio-cultural FES?

- By private actors
 - Service innovation
 - Quality assurance: standards, certification & labelling
 - Networking & promotion of good practices

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Networking and promotion of good practices (Community forests in Wales)



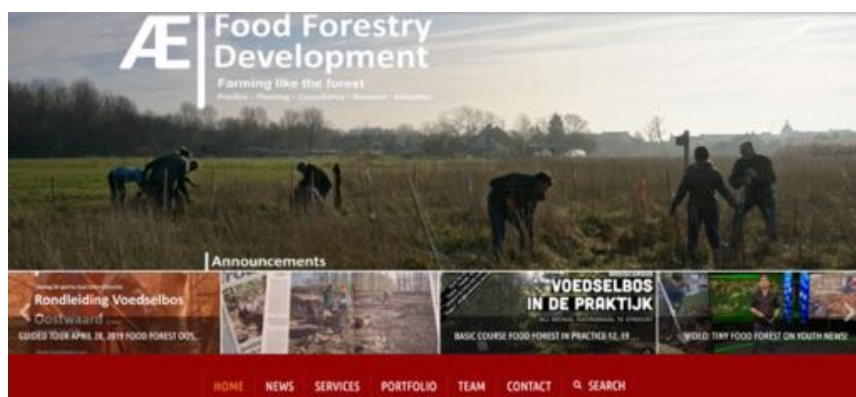
<https://www.communitywoods.org/>

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Networking and promotion of good practices (Food forests in the Netherlands)



<https://www.gcfinland.fi/>

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How to foster the provision of socio-cultural FES?

- By private actors
 - Service innovation
 - Quality assurance: standards, certification & labelling
 - Networking & promotion of good practices
 - Advocacy

Advocacy

Green4C Alliance (75 members)



Green4C Provider

Are you an individual or organization seeking to enhance your understanding of the emerging markets, tools and science in the Green4C thematic sectors, and do you have related experience to share? Do you want to recruit and network with highly specialized young researchers and students?

We offer you:

- List of trained professionals for internship
- Innovative new lines of business and project development in Green4C
- Networking and collaboration with universities and research institutions



Green4C Scientific Mentor

Do you represent a Higher Education Institution wishing to enhance research opportunity, strengthen employability, creativity and new professional paths for young researchers and professionals?

We offer you:

- List of organizations for students' internships
- Networking and collaboration with innovation-oriented Green Care organizations
- Grant updates for market-oriented research projects
- New ideas for business-research projects
- Updates in the field of Green Care



Green4C Supporter

Are you looking for new solutions and alternatives in Green4C thematic sectors to understand more about their current innovation, growing markets and opportunities?

We are looking for project investors, supporters and experienced practitioners of these sectors to explore these new opportunities with us!

We offer you:

- Innovative Green4C business plans to invest/support
- Enhanced visibility
- Networking/Collaboration with universities and businesses and Europe's fastest growing and largest network in Green Care



Green4C Entrepreneur

Are you a student or a researcher with innovative ideas in Green Care?

Do you want to improve your project or business idea and create your own start up?

We offer you:

- Specialized business training in the Green4C thematic sectors
- Business & Scientific Mentorship
- Enhancing financing opportunities
- Networking and collaboration with other social entrepreneurs and innovators

Advocacy (Green 4 Care Blue Print)

RECOMMENDATIONS

The following recommendations aim to centre policy on the role of ecosystem services for health, well-being and social inclusion. These recommendations are provided for different stakeholders such as policy makers, service providers, professionals, land managers, funders, supporters, researchers and scientists involved or interested in Green Care.

For policy makers:

a) Institutional and legal clarity on the role and responsibilities of Green Care providers (both non-profit and for-profit) should be ensured. Greater clarity should be provided to:

- 1) define the sector of Green Care
- 2) understand the new well-being and social inclusion
- 3) address the legal responsibilities

b) Health and well-being funding, technical assistance and communication. Policy makers and land managers should:

- 1) ensure funding and technical assistance

For research and the academic community:

a) The health, well-being and social inclusion-related impacts of Green Care initiatives should be scientifically evaluated and documented for comparative analysis. Scientists can support practitioners by developing robust methodologies and user-friendly impact assessment tools to collect data and monitor their impacts. In addition to health, well-being and social inclusion, environmental, social and economic impacts of Green Care initiatives can also be studied to help recognise the multifunctionality of these initiatives. Green Care initiatives in cities, municipalities and rural areas that have been actively investing in green spaces for health, well-being and social inclusion can be analysed through in-depth studies to better inform policy lead to the uptake and replication of similar approaches and lead to the recognition of the contributions and positive impacts of Green Care initiatives in achieving international targets, including the Sustainable Development Goals, on both environmental and social dimensions.

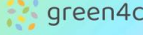
b) Trade-offs, possible synergies and co-benefits need to be identified. For example, in forestry logging, while synergies may be possible, it is important to ensure that there are mechanisms in place to manage the trade-offs.

c) The development of Green Care initiatives should be accompanied by common quality standards and certification. Common quality standards and certification can help to ensure the quality of the service and provide a framework for continuous improvement.

For funders and supporters:

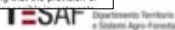

a) Innovation and entrepreneurship in Green Care should be facilitated and nurtured through knowledge hubs and innovation accelerator programmes. In Green Care, champions are key, yet often innovators lack skills on how to develop business plans, gain broader skillsets and enlarge networks to build social capital. There is a need to create innovative environments and settings that support prototyping, development, implementation and evaluation of the proposed Green Care activities. Knowledge hubs, incubators and accelerator programmes focussing on fostering innovation and entrepreneurship capacity provide access to learning, grants and mentorship as well as opportunities for initial investments in Green Care initiatives.

b) Civil society organisations, no-profit and charity initiatives can support the application of responsible or ethical finance and socially responsible investments. Thanks to their unique perspective, civil society organisations can play a key role in ensuring that the provision of Green Care initiatives is aligned with the values and principles of the Green Care movement.

 **green4c**

**EU BLUEPRINT ON GREEN CARE:
NATURE FOR HEALTH,
WELL-BEING AND SOCIAL INCLUSION**

www.greenforcare.eu

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How to foster the provision of socio-cultural FES?

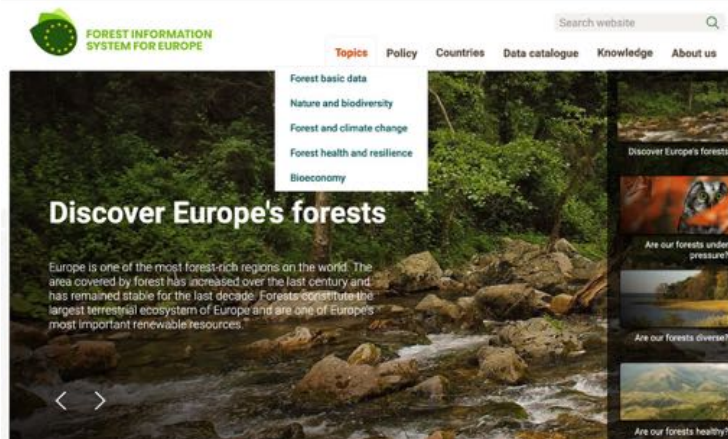
- By private actors
 - Service innovation
 - Quality assurance: standards, certification & labelling
 - Networking & promotion of good practices
 - Advocacy
- By public agents
 - Monitoring




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Monitoring

Unfortunately, no regular monitoring of the socio-cultural FES in the EU...



<https://forest.eea.europa.eu/>

TESAF
European Terrestrial
Ecosystem Assessment



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... neither in Europe State of Europe's Forests 2020

Criterion 6: Maintenance of other Socioeconomic Functions and Conditions	162
Indicator 6.1 Forest holdings	163
Indicator 6.2 Contribution of forest sector to GDP	166
Indicator 6.3 Net revenue	172
Indicator 6.4 Investments in forests and forestry	174
Indicator 6.5 Forest sector workforce	177
Indicator 6.6 Occupational safety and health	180
Indicator 6.7 Wood consumption	184
Indicator 6.8 Trade in wood	187
Indicator 6.9 Wood energy	191
Indicator 6.10 Recreation in forests	195
Indicator C6: Policies, institutions and instruments to maintain other socioeconomic functions and conditions	197

<https://foresteurope.org/>

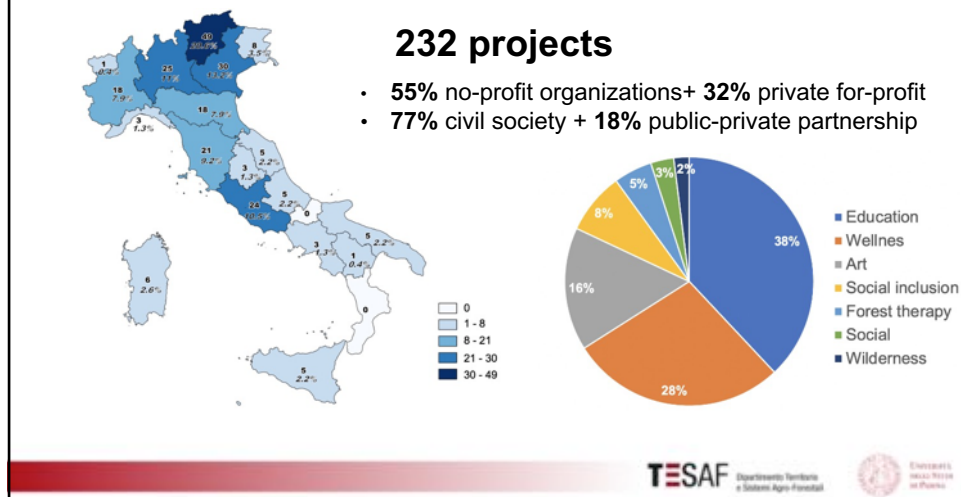
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Ecosystem Assessment



UNEP
United Nations Environment Programme

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At national scale some good spot examples (Italy: Doimo *et al.*, 2021)



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How to foster the provision of socio-cultural FES?

- By private actors
 - Service innovation
 - Quality assurance: standards, certification & labelling
 - Networking & promotion of good practices
 - Advocacy
- By public agents
 - Monitoring
 - R&D

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Research and development

- H2020 Sincere project
<https://sincereforests.eu/>
- H2020 Nobel project
<https://nobel.boku.ac.at/the-project/>
- ES partnership - Esmeralda project
<https://www.es-partnership.org/esmeralda-project/>
- OPPLA - EU Repository of Nature-Based Solutions
<https://oppla.eu/about>
- Erasmus+ KA project ECOSTAR
<https://www.ecostarhub.com/>
- ...



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How to foster the provision of socio-cultural FES?

- By private actors
 - Service innovation
 - Quality assurance: standards, certification & labelling
 - Networking & promotion of good practices
 - Advocacy
- By public agents
 - Monitoring
 - R&D
 - Training



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Training and promotion of local initiatives (Forest Care initiatives in Finland)

<https://www.gcfinland.fi/>

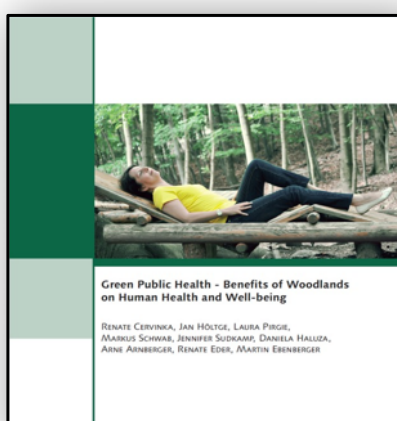


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Training + R&D Green care and forest-care



Cervinka *et al.* (2014)
<http://bfw.ac.at/greencareforest>

Research project by
The Austrian Research centre
for Forests program

in support of the

Measure of the Austrian Rural
Development Program

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Training on entrepreneurship (E-learning course organized by the Erasmus+ project Green4C)



Green Care: from academic theory to entrepreneurial practice



Green4C e-learning course, First Edition

<https://www.greenforcare.eu/>

- **Module 1 - Introduction**
Activities: welcome, objectives and learning outcomes, participants self-introduction and learning path, the Green4C project.
- **Module 2 - Nature-based solutions, health, well-being and social inclusion**
Activity 1: Nature for Health, Well-being and Social Inclusion: Green Care, conversation with expert;
Activity 2: Green spaces for well-being, inspirational video, report your own experience, conclusion and evaluation of the week.
- **Module 3 - Green Care in action: thematic sectors and different approaches**
Activity 1: forest-based care - definitions and overview of the literature, main characteristics of the forest-based care initiatives, a conversation with an expert, real experiences (video), co-creation of a database of cases;
Activity 2: Social agriculture - definitions, real experiences (video), a conversation with an expert, co-creation of a database of cases;
Activity 3: Urban green care - definitions, a conversation with an expert, real experiences (video), co-creation of a database of cases;
Activity 4: Green care tourism - definitions, a conversation with an expert, real experiences (video) a database of cases;
Activity 5: conclusion and evaluation of the week.
- **Module 4 - Actors, partnerships and institutional frameworks**
Activity 1: Actors and partnerships in Green Care - theory on actors and partnerships in the sector, a webinar on green prescriptions on nature and mental health, a video on how research can support social enterprises;
Activity 2: Institutional frameworks for initiatives in Green Care, policies for the sector, legal frameworks and bureaucratic issues, thematic forums.
- **Module 5 - Becoming an entrepreneur in Green Care**
Activity 1: Deciphering the markets in Green Care - innovation in Green Care, market outlooks;
Activity 2: Entrepreneurship in Green care - entrepreneurs and type of enterprises, interviews with some entrepreneurs;
Activity 3: Start realising your idea - identify a challenge and your response to it, first step from your idea to a business;
Activity 4: Value Proposition and Business Model Canvases - theory, some good examples, Q&A from entrepreneurs.
- **Module 6 - Resources and soft skills for entrepreneurs**
Activity 1: Tips on marketing, networking, getting help from mentors and advisors, financial planning and sources of financing and fundraising;
Activity 2: Let's practice with entrepreneurs!
- **Module 7: Your turn!**
Activity 1: Building the Wikipedia page of Green Care;
Activity 2: Developing your own business idea.
- **Module 8 - Final evaluation**
Activity 1: complete and present Learning Journey Canvas and share it with the group;
Activity 2: Wrap up, reflections on the course, evaluation by the tutors, course evaluation by students.

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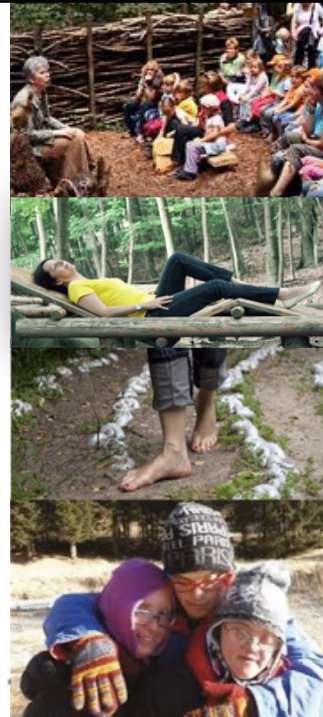
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de Extremadura

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<https://www.greenforcare.eu>

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- Trends in ES provision and related impacts on forest labour market
- The policy framework
- Marketing cultural ES associated to green jobs
- **Concluding remarks**



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Ta patemata matemata
Tragedies are teaching us
(Thucydides)

COVID-19 is helping us to give evidence to:

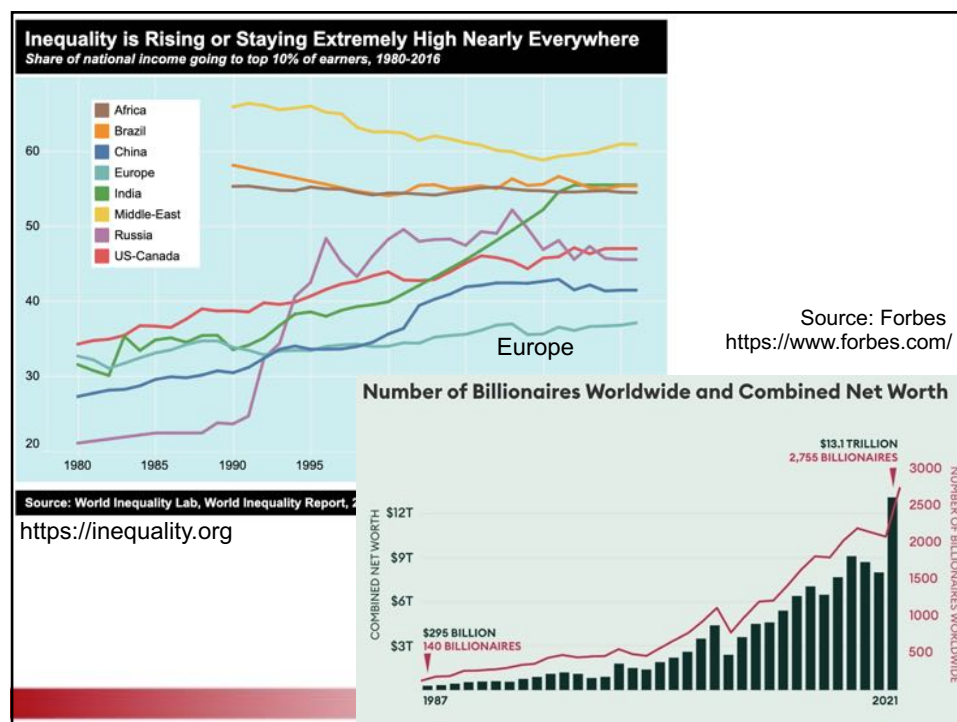
- (i) The **need of the State** (= a regulative authority for an active welfare policy)
- (ii) **different working conditions** are not only feasible but convenient for the health of employees
- (iii) **social relations** are important drivers of the life quality

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All these 3 new evidences are supporting investment in socio-cultural FES because these solutions are:

- relatively **low-cost solutions**, much based on small-scale activities, frequently connected to non profit organizations (“social economy”), inspired by values of solidarity and social inclusion
- based on **natural resources** that, with an increasing use, become more recognized for their high social values, and turn out to be **more protected**
- **labour-intensive solutions** in a context where we are facing problems of un-employment and raising **social inequality**

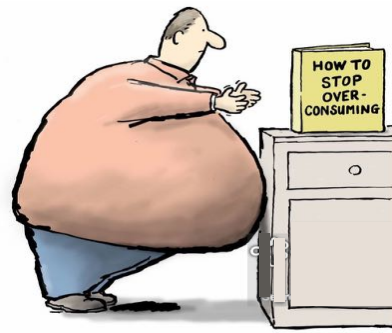
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"In the midst of every crisis, lies great opportunity"
Albert Einstein

Socio-cultural FES: a useful tool for building the ecological transition, taking into consideration that most of our problems are due to an **excess of resources** and their **mis-allocation and unfair distribution**



CHRIS MADDEN