The importance of the forest functions in South Italy: An analysis of the social perception

Pastorella Fabio[1]
Giacovelli Grazia[1]
Maesano Mauro[2]
Paletto Alessandro[1]
Vivona Sonia[2]
Veltri Antonella[2]
Pellicone Gaetano[2]
Scarascia Mugnozza Giuseppe[3]

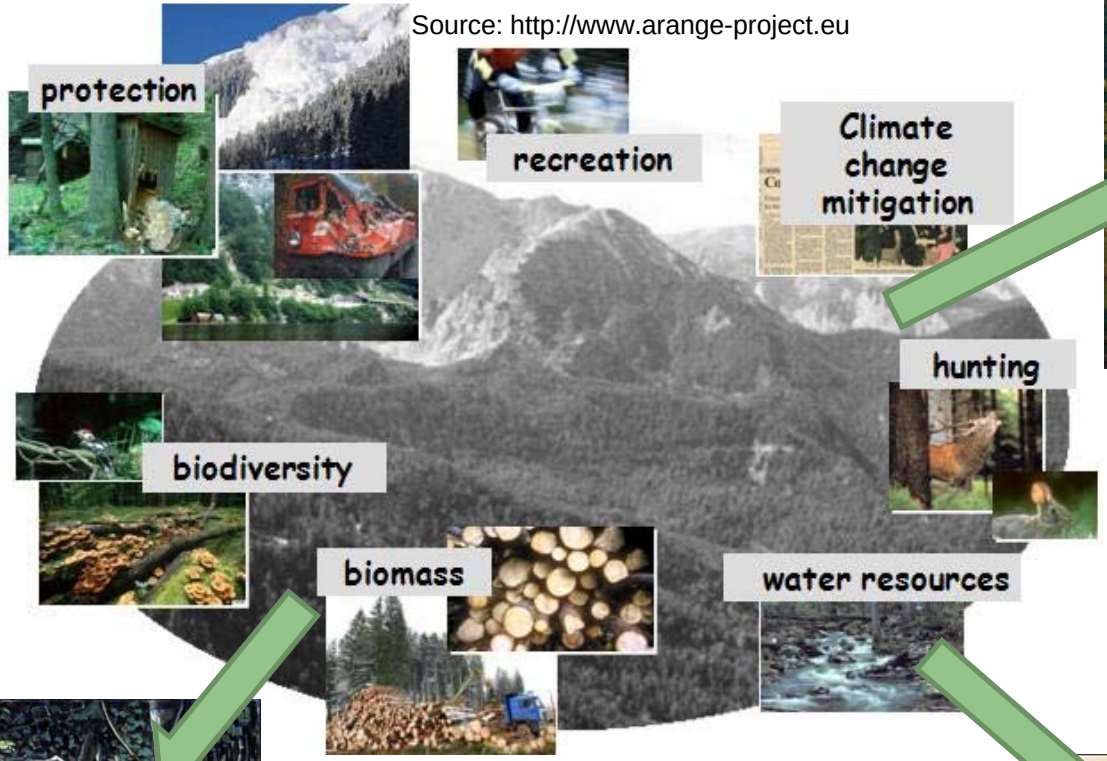
1* - Corresponding author: Council for Agricultural Research and Economics – Forest Monitoring and Planning Research Unit (CREA-MPF)

2 - National Research Council of Italy, Institute for Agricultural and Forest Systems in the Mediterranean (CNR-ISAFOM)

3 - Department of Innovation in Biological, Agro-Food and Forest System (DIBAF), University of Tuscia

MULTIFUNCTIONALITY OF FORESTS
....AND THEIR PERCEPTION

Source: http://www.arange-project.eu



Wooded Path, Monet 1865.

Stump with spotted tree, Cutler 2006.

Rippled Surface, Esher 1950.

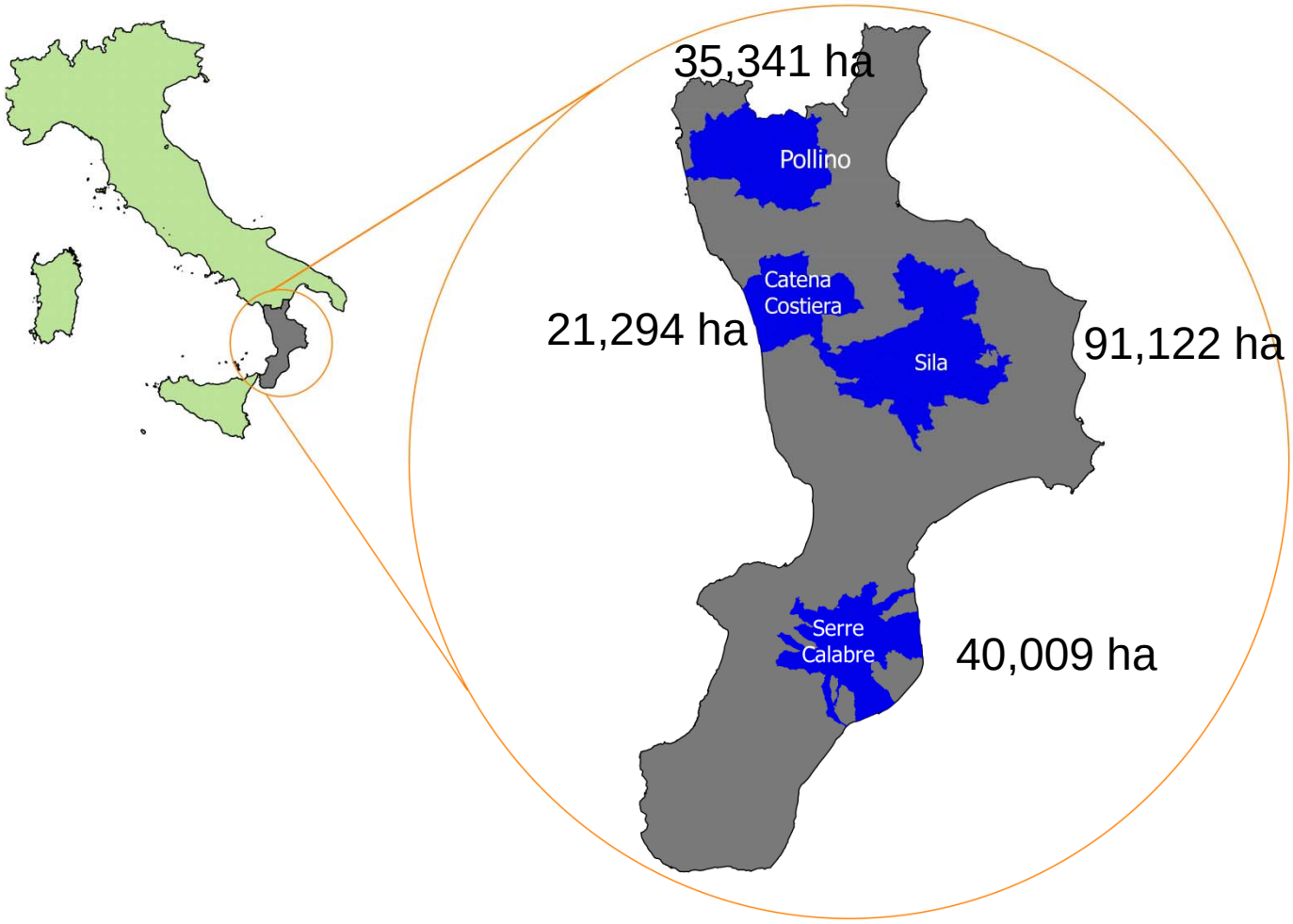
OBJECTIVES AND STRUCTURE

Analyse the social perception about the importance of forest functions and threats to the multifunctionality.

- stakeholder analysis
- questionnaire survey
- statistical analysis of the collected data
- development of importance-threat matrices (opinions and perceptions)

CASE STUDIES

- Pollino, Sila, Catena Costiera and Serre Calabre (40% of the Regional Forest Area)



SOCIAL VALUATION

- valuable tool able to consider the social importance assigned to each forest function (Felipe-Lucia et al. 2015) addressing the multi-functional forest management systems based on the multifunctionality.
- based on opinions, perceptions and preferences of social actors (e.g. stakeholders, citizens, and groups of interest).
- basis for embarking on a process of public involvement in decisions in order to:
  - reduce the conflicts between users,
  - legitimate the decision-making process,
  - increase the social acceptance.

QUESTIONNAIRE SURVEY

Characteristics	
Survey period	2015 – 2016
Target	Stakeholders (Public administrations; environmental NGOs; Academia; professional associations)
Administration system	Face-to-face interviews/emails
N° questions	12 (closed-ended questions, 5-point Likert scale)
Contacted people	319 stakeholders
Sampling method	snowball sampling (non-random method)

QUESTIONNAIRE SURVEY

- 4 thematic sections:

1) Organization informations

2) Importance of forest functions

3) Relevance of threats

4)Personal informations

QUESTIONNAIRE
"Ambi.Tec.Fil.Legno" Project

The questionnaire is part of the research activities of the Project "ALForLab" (PON03PE_00024_1) co-funded by the National Operational Programme for Research and Competitiveness (PON R&C) 2007-2013, through the European Regional Development Fund (ERDF) and national resource (Revolving Fund - Cohesion Action Plan (CAP) MIUR). The questionnaire was prepared by CREA (Council for Agricultural Research and Economics) and CNR-ISAFOM (National Research Council of Italy, Institute for Agricultural and Forest Systems in the Mediterranean). The aim of this research activity is to understand the stakeholders' opinions and perceptions on forest multifunctionality in order to improve the local forestry sector in Calabria region.
Please, answer as a representative of your organization/association. Thank you for your collaboration.

Interviewer: _____ Date: _____

1. Study area:
- ☐ Pollino
- ☐ Sila
- ☐ Serre Calabre
- ☐ Catena Costiera

1.1 Name of organization/association:_____

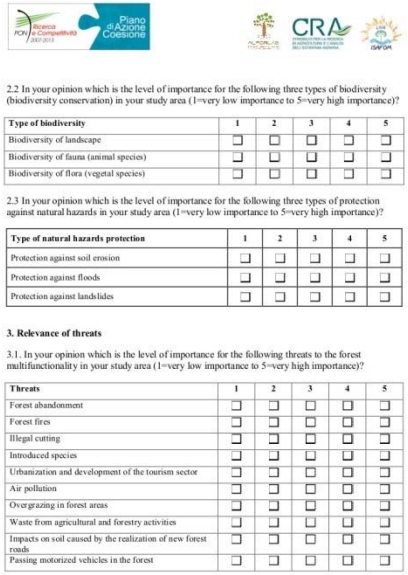
1.2 Location of organization/association (municipality):_____

1.3 Role in the organization/association:_____

2. Importance of forest functions

2.1 In your opinion which is the level of importance for the following forest function in your study area (1=very low importance to 5=very high importance)?

Forest functions	1	2	3	4	5
Landscape conservation	☐	☐	☐	☐	☐
Biodiversity conservation	☐	☐	☐	☐	☐
Recreation in forest (outdoor recreation and gaming)	☐	☐	☐	☐	☐
Timber production	☐	☐	☐	☐	☐
Bioenergy production	☐	☐	☐	☐	☐
Non-wood forest production (e.g. chestnuts, berries, mushrooms)	☐	☐	☐	☐	☐
Protection against natural hazards	☐	☐	☐	☐	☐
Improvement of air quality	☐	☐	☐	☐	☐
Improvement of water quality	☐	☐	☐	☐	☐



2.2 In your opinion which is the level of importance for the following three types of biodiversity (biodiversity conservation) in your study area (1=very low importance to 5=very high importance)?

Type of biodiversity	1	2	3	4	5
Biodiversity of landscape	☐	☐	☐	☐	☐
Biodiversity of fauna (animal species)	☐	☐	☐	☐	☐
Biodiversity of flora (vegetal species)	☐	☐	☐	☐	☐

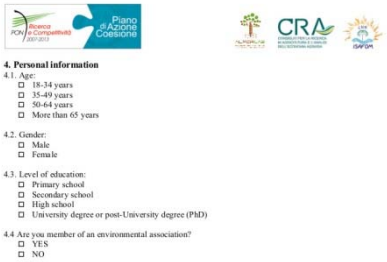
2.3 In your opinion which is the level of importance for the following three types of protection against natural hazards in your study area (1=very low importance to 5=very high importance)?

Type of natural hazards protection	1	2	3	4	5
Protection against soil erosion	☐	☐	☐	☐	☐
Protection against floods	☐	☐	☐	☐	☐
Protection against landslides	☐	☐	☐	☐	☐

3. Relevance of threats

3.1. In your opinion which is the level of importance for the following threats to the forest multifunctionality in your study area (1=very low importance to 5=very high importance)?

Threats	1	2	3	4	5
Forest abandonment	☐	☐	☐	☐	☐
Forest fires	☐	☐	☐	☐	☐
Illegal cutting	☐	☐	☐	☐	☐
Introduced species	☐	☐	☐	☐	☐
Urbanization and development of the tourism sector	☐	☐	☐	☐	☐
Air pollution	☐	☐	☐	☐	☐
Overgrazing in forest areas	☐	☐	☐	☐	☐
Waste from agricultural and forestry activities	☐	☐	☐	☐	☐
Impacts on soil caused by the realization of new forest roads	☐	☐	☐	☐	☐
Passing motorized vehicles in the forest	☐	☐	☐	☐	☐



4. Personal information

4.1. Age:
- ☐ 18-34 years
- ☐ 35-49 years
- ☐ 50-64 years
- ☐ More than 65 years

4.2. Gender:
- ☐ Male
- ☐ Female

4.3. Level of education:
- ☐ Primary school
- ☐ Secondary school
- ☐ High school
- ☐ University degree or post-University degree (PhD)

4.4 Are you member of an environmental association?
- ☐ YES
- ☐ NO

Forest Functions

Forest Threats

OCIO-DEMOGRAPHIC CHARACTERISTICS

6% = male
4% = female

Level of education

- 39% = High school degree
- 61% = University/post University degree

Age

- 21% = 18-34 years old
- 37% = 35-49 years old
- 31% = 50-64 years old
- 10% = ≥65 years old

ESULTS

Study areas	N	%
Sila	36	53
Pollino	13	19
Serre Calabre	12	18
Catena Costiera	7	10
TOT	68	100

Groups	N	%
Public administrations	26	37
NGOs	19	27
Academia	14	20

ocial Perception - Mean Value

Forest functions	Mean (*n*=70)
dscape conservation	4.50
iversity conservation	4.57
Recreation	3.64
imber production	3.01
penergy production	3.01
NWFP production	3.80
ral hazards protection	4.29

Threats	Mean (*n*=70)
Forest abandonment	3.84
Forest fires	4.17
Illegal cutting	4.24
Introduced species	3.35
Urbanization	3.28
Air pollution	3.31
Overgrazing in forest areas	2.90
Waste	3.61

TUDY AREAS – FOREST FUNCTIONS

est functions	Pollino (*n*=13)	Sila (*n*=36)	Catena Costiera (*n*=7)	Serre Calabre (*n*=12)
ape conservation	4.77	4.47	4.36	4.42
rsity conservation	4.69	4.58	4.73	4.75
Recreation	3.62	3.77	3.57	3.42
ber production	2.46	3.06	2.83	3.67
ergy production	2.46	2.91	4.00	3.42
FP production	3.69	3.86	3.57	3.83
hazards protection	4.46	4.11	4.57	4.42

TUDY AREAS – FOREST THREATS

Forest Trheats	Pollino (*n*=13)	Sila (*n*=36)	Catena Costiera (*n*=7)	Serre Calabre (*n*=12)
orest abandonment	3.75	4.00	3.57	3.67
Forest fires	4.15	4.28	3.86	4.00
Illegal cutting	4.08	4.39	3.57	4.33
ntroduced species	3.85	3.24	2.50	3.67
Urbanization	3.15	3.23	3.71	3.42
Air pollution	3.00	3.47	3.43	3.17
grazing in forest areas	3.23	2.85	3.00	2.67
Waste	3.08	3.89	3.71	3.25
ation new forest roads	2.69	2.27	2.29	2.83

OUPS OF STAKEHOLDERS – FOREST FUNCTIONS

rest functions	Public administrations (n=26)	NGOs (n=19)	Academia (n=14)	Professional associations (n=11)
cape conservation	4.54	4.63	4.21	4.55
ersity conservation	4.46	4.79	4.43	4.64
Recreation	3.85	3.56	3.07	4.00
ber production	3.24	2.72	2.29	3.91
nergy production	3.58	2.61	2.21	3.36
VFP production	3.69	3.89	3.64	4.09
hazards protection	4.46	4.32	3.64	4.64
ality improvement	4.50	4.68	3.86	4.64

ROUPS OF STAKEHOLDERS – FOREST THREATS

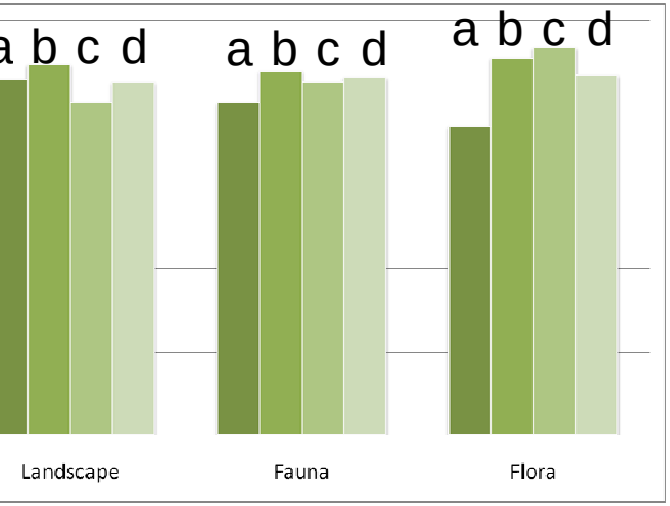
orest Threats	Public administrations (n=26)	NGOs (n=19)	Academia (n=14)	Professional associations (n=11)
est abandonment	3.73	3.53	3.57	4.91
Forest fires	4.02	4.29	4.14	4.36
llegal cutting	4.12	4.53	4.07	4.27
roduced species	3.24	3.72	2.77	3.70
Urbanization	3.27	3.56	3.21	2.91
Air pollution	3.38	3.63	3.07	2.91
azing in forest areas	3.19	3.11	2.08	2.82
Waste	3.42	3.84	3.71	3.55
ion new forest roads	3.38	4.22	2.86	3.36

RUSKAL-WALLIS TEST

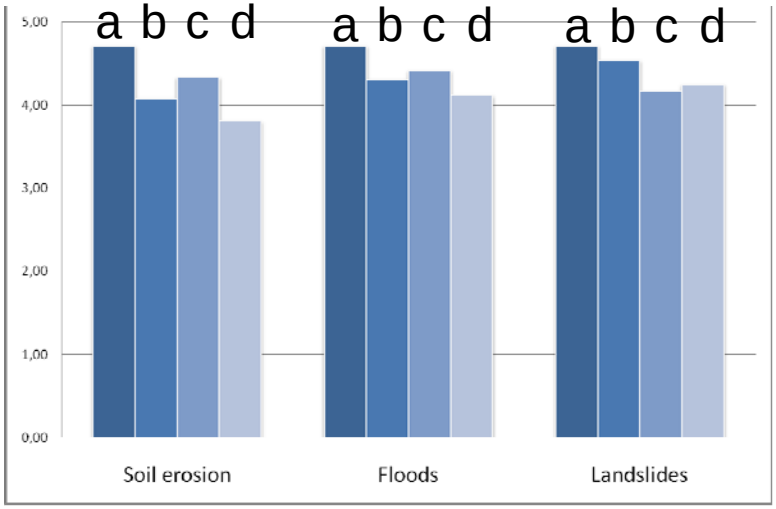
Variables		Study Area		Groups of stakeholders	
		χ^2	p value	χ^2	p value
ons	Landscape conservation	2,13	0,71	4,15	0,25
	Biodiversity conservation	3,15	0,53	4,36	0,23
	Air quality improvement	0,63	0,96	6,05	0,11
	Natural hazards protection	2,86	0,58	7,28	0,06*
	Water quality improvement	5,58	0,23	5,46	0,14
	NWFP production	2,35	0,67	1,77	0,62
	Recreation	1,06	0,90	8,34	0,04**
	Timber production	5,46	0,24	10,09	0,02**
	Bioenergy production	7,55	0,11	11,86	0,01**
ts	Illegal cutting	2,82	0,59	1,61	0,66
	Forest fire	2,32	0,68	0,84	0,84
	Forest abandonment	5,00	0,29	10,73	0,01**
	Waste	6,91	0,14	0,87	0,83
	Realization new forest roads	1,73	0,79	7,76	0,05**
	Motorized vehicles in forest	4,94	0,29	9,10	0,03**
	Introduced species	8,48	0,08*	5,22	0,16

ocus - Area

odiversity

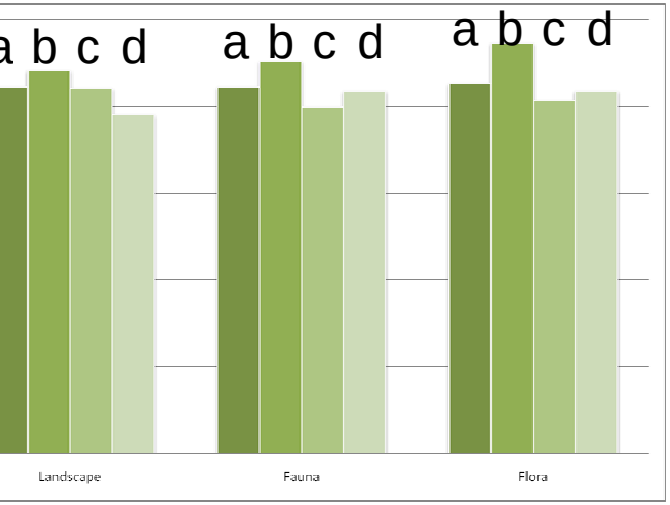


Protection

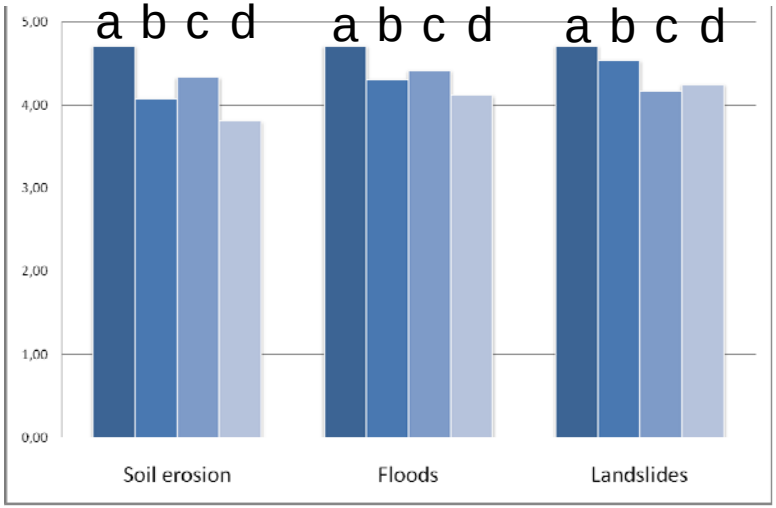


ocus - Groups

odiversity



Protection



RUSKAL-WALLIS TEST FOCUSES

Variables	Study Area		Groups of stakeholders	
	χ^2	p value	χ^2	p value
odiversity of landscape	2,80	0,59	1,37	0,71
odiversity of fauna	3,43	0,49	5,10	0,16
odiversity of flora	10,08	0,04	7,40	0,06
otection against soil erosion	6,69	0,15	10,79	0,01
otection against floods	5,91	0,21	1,88	0,60
otection against landslides	3,67	0,45	2,03	0,57

ISCUSSION

ner studies (e.g. Clemente et al. 2015; Dobšinská l Sarvašová 2016; Kumar and Kant 2007; Paletto et 2014) found that regulating services and reational services (functions) have high portance while provisioning have low importance.

ner studies (e.g. Michetti and Pinar 2013; Paletto et 2014; Vaglio Laurin et al. 2016) confirmed the evance of forest fires, illegal cutting and forest donment.

Calvache M.F., Antunes P., Santos R. (2015): Mapping stakeholders perception on ecosystem services provision the Portuguese Southwest Alentejo and Vincentine Coast Natural Park. VIII Congresso sobre Planeamento e Gestão onas Costeiras dos Países de Expressão Portuguesa, Aveiro (Portugal), 14th-16th October 2015.
, Sarvašová Z. (2016): Perceptions of Forest Owners and the General Public on the Role of Forests in Slovakia. Acta tica & Lignaria Hungarica, 12: 23-33.
ant S. (2007): Exploded logit modeling of stakeholders' preferences for multiple forest values. Forest Policy

ONCLUSIONS

ception of forest functions and threats depend the individual characteristics of the stakeholders . knowledge, environmental sensibility) not y by the social-economics characteristics.

Calabria the forest sector is important from the nomic point of view. Otherwise the perception he productive functions is low (potential flicts?).

est management may play an important role to e potential conflicts resulting from illegal

Thanks for your attention!

For any question please contact me at:
fabio.pastorella@crea.gov.it

Project "ALForLab" (PON03PE_00024_1) co-funded by the National Operational Programme for Research and Competitiveness (PON R&C) 2007-