

Timber or Non-Timber Forest Products: How do stakeholders perceive the ecosystem services provided by tropical forests in Central Africa?

Simon LHOEST,
Marc DUFRÊNE,
Cédric VERMEULEN,
Jean-Louis DOUCET,
Adeline FAYOLLE

 LIÈGE université
Gembloux
Agro-Bio Tech

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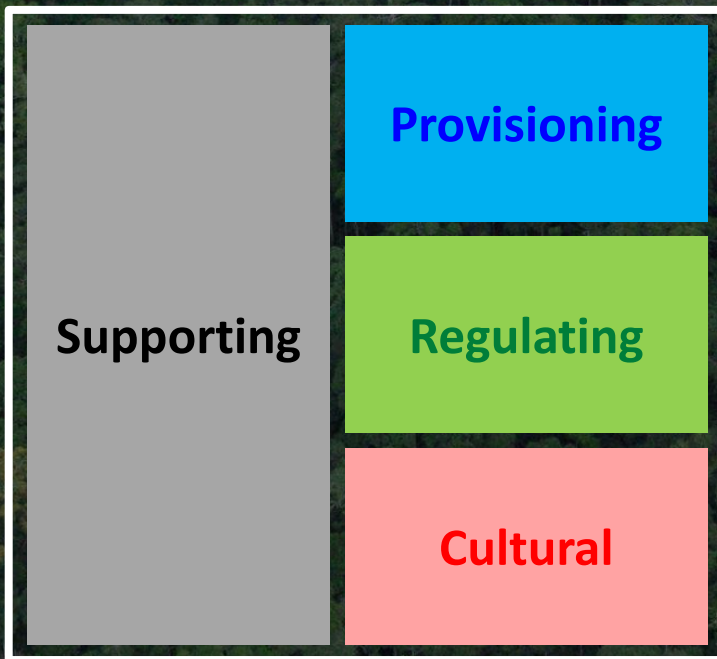
 IUFRO

Interconnecting Forests,
Science and People

125th Anniversary
Congress 2017

Ecosystem services (ES) in tropical forests?

Nutrient cycling,
Soil formation,
Primary production, ...



NTFP, Meat, Fish,
Wood, Medicine, ...

Biodiversity, Water,
Climate, Air,
Protection, Soil, ...

Heritage, Housing,
Tourism, Education,
Rites, Relaxation, ...

(Millenium Ecosystem Assessment, 2014)

6 800 000 000 000 \$/year

(Costanza *et al.*, 2014)

- **ES trade-offs** and **synergies** barely addressed
- **Economic** valuation & **ES mapping** > ¾ of the studies
- Mainly **provisioning** services, much less **cultural** services

(Wangai *et al.*, 2016)

Research needs in ES assessments?

Integrative approach:

Ecological + **Economic** + **Social**

Burkhard *et al.* (2010)

Research need

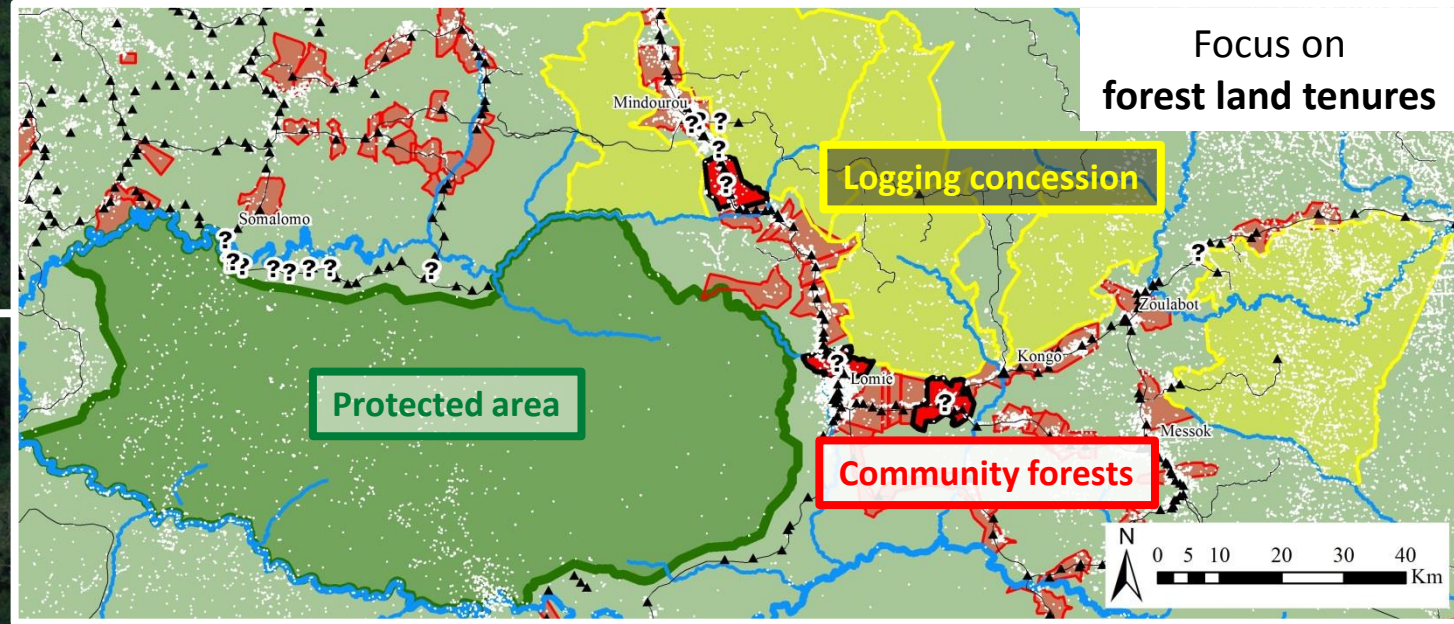
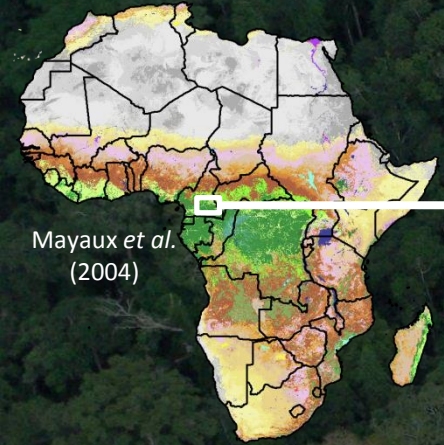
- + Valuation of cultural services
- + Understanding complex socio-ecological systems
- + Social & policy relevance of the ES assessment

Orenstein & Groner (2014)

1. Which are the most frequently reported ecosystem services provided by tropical forests to local populations, as perceived by all forest stakeholders?
2. What are the synergies and trade-offs between the perceptions of all ecosystem services?
3. Do any social and/or spatial parameters explain the perceptions of ecosystem services?

Study area: South-East Cameroon

4



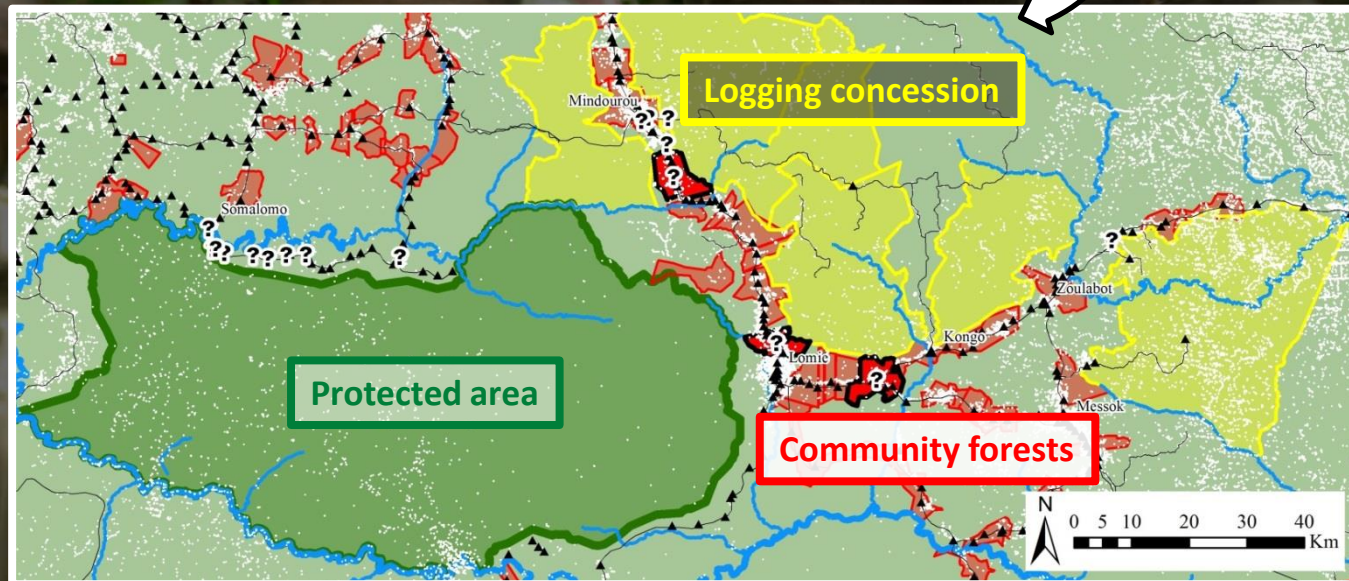
Local populations: Bantu and Baka Pygmies
Widely dependent on the forest for their daily activities

- **225 individual interviews of forest stakeholders**
→ Quantitative perceptions of ES provided to local populations

- Stratified sampling approach:
75 interviews in each land tenure, in a total of 23 locations

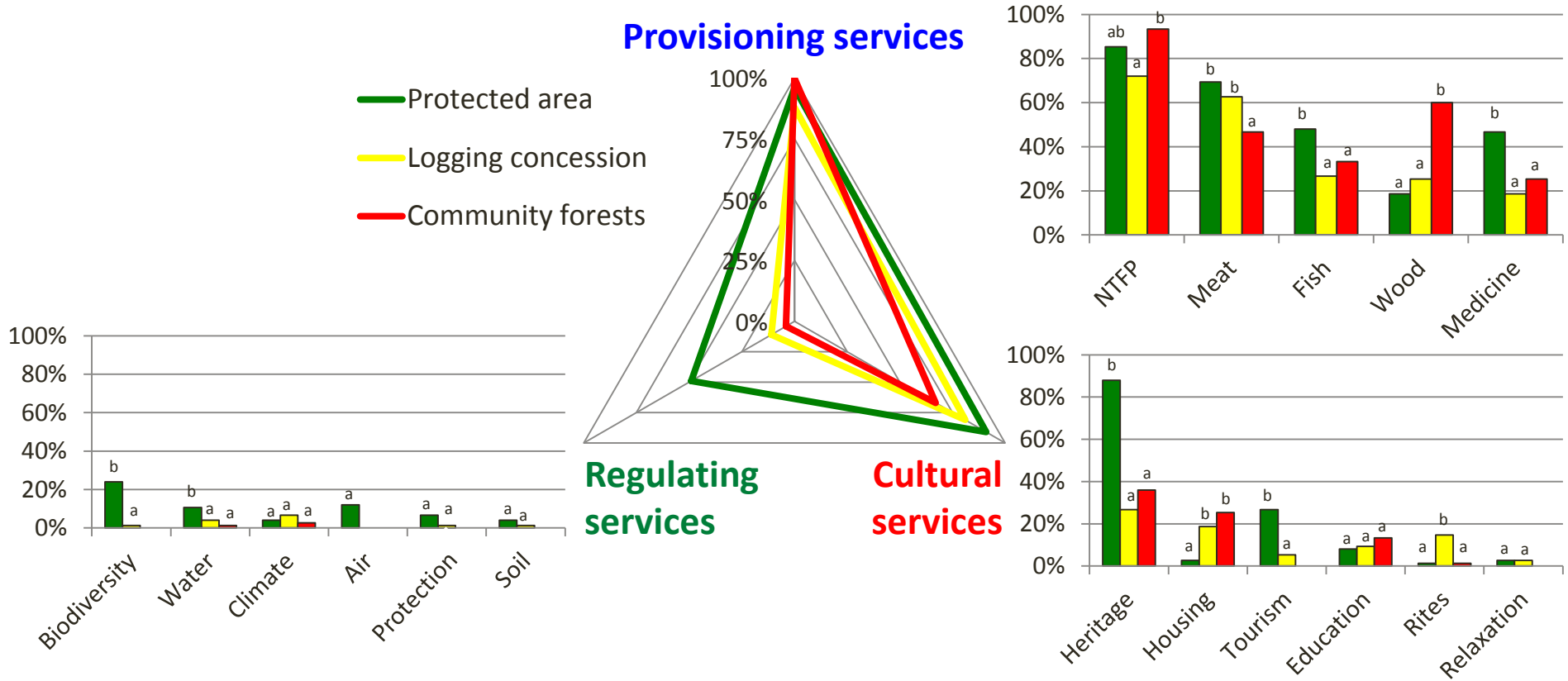


- **Social parameters:**
Gender, age, ethnic group, job
- **Spatial parameters:**
Land tenure, deforestation rate



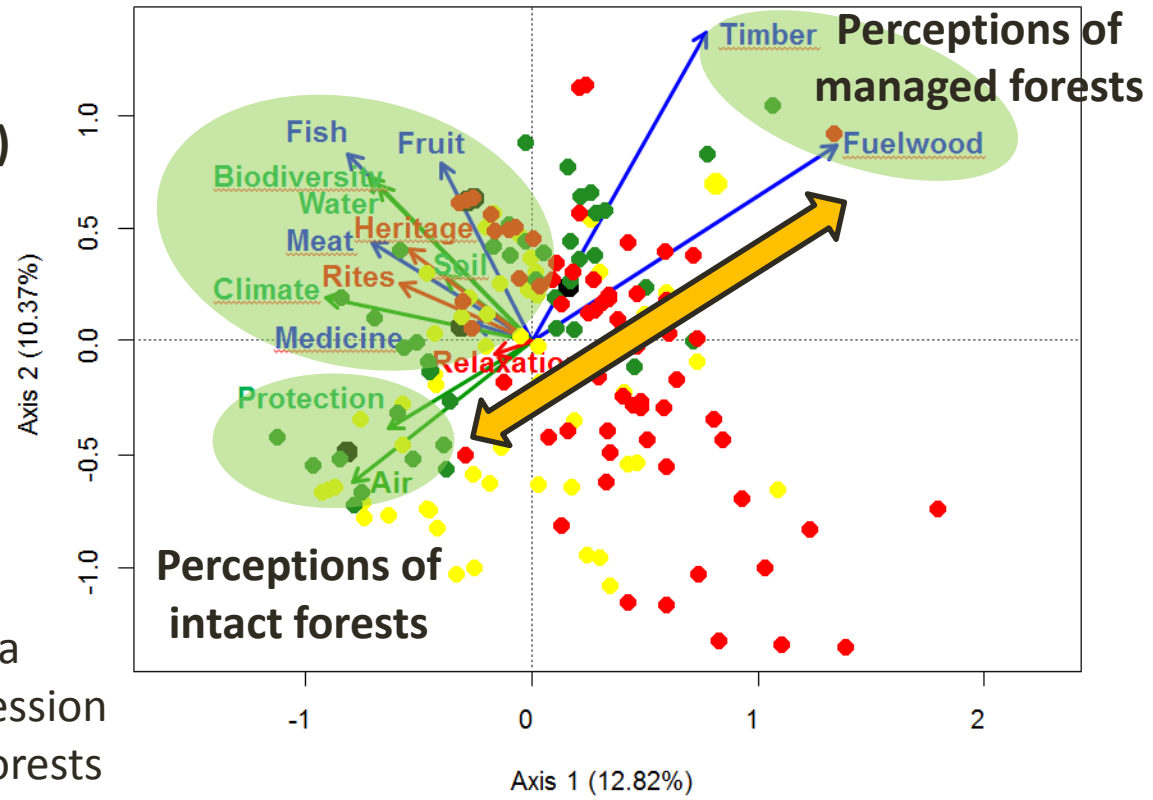
Results

1. Which are the **most frequently reported ecosystem services** provided by tropical forests to local populations, as perceived by all forest stakeholders?



2. What are the synergies and trade-offs between the perceptions of all ecosystem services?

Principal Components Analysis (PCA)



ES categories:
Provisioning
Regulating
Cultural

Synergies

Trade-offs

3. Do any social and/or spatial parameters explain the perceptions of ecosystem services?

Provisioning

Not explained ←

Regulating

Not explained ←

Cultural

Ecosystem services	Social parameters				Spatial parameters	
	Gender	Job	Ethnic group	Age	Deforestation	Land tenure
Fruit		*			*	***
Meat			**	**	*	**
Fish				*	***	***
Fuelwood		*			***	***
Timber	**	*			**	**
Medicine						
Biodiversity		**	**	***	***	***
Water					*	
Climate				**	*	*
Air						
Protection	*					
Soil						
Heritage			**			
Rites					*	**
Relaxation			*			

2*/15

4*/15

4*/15

4*/15

9*/15

8*/15

0% **Increasing deforestation rate (2000-2012)** → 14%

Fish Biodiversity Climate Water Rites Fruit Meat

Timber Fuelwood

Differences and complementarity between **land tenures**

(Nasi *et al.*, 2012)

→ Important role of **production forests** in the provision of ES

Deep disconnection between perceptions of **regulating services** of local stakeholders and international organisms

(Martín-López *et al.*, 2012;
Menzel & Teng, 2010;
Raudsepp-Hearne *et al.*, 2010)

→ **Integrate local actors** in policy decisions

→ **Sensitization** of local stakeholders about regulating services

Social approaches: compulsory to quantify **cultural services**

Next step: ongoing **ecological quantification** of the most debated ES

→ e.g. Biodiversity
& Hunting:



1. Most frequently reported ecosystem services for local populations:

Provisioning > **Cultural** > **Regulating**

2. Perceptions of intact forests \longleftrightarrow managed forests,
but most services are independent of this gradient

3. ES perceptions are mainly explained by **spatial parameters** >< social parameters

Thanks for your attention!

« To assess ecosystem services in a particular region, we have to work our way backwards from society and its specific needs to ecosystem processes – and not vice versa, as scientists mostly do » (Jax, 2010)

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