



Ecosystems services valuations in France: Methodologies and application(s) + Tools at Ineris

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Ecosystems (services) valuation: In France, a process driven by the Environment Ministry

“Give a value to the environment: a delicate but necessary exercise”
(CGDD, 2010)

Purpose of economic valuation of ecosystems (services) for the
Government

- International negotiations
- Environmental policies assessment
- Decision support information for infrastructure and environment projects, plans or programmes



The Ministry relies on various institutions to carry out methodological and technical developments

According to the Foundation for Biodiversity Research more than 170 researchers work on biodiversity valuation in France

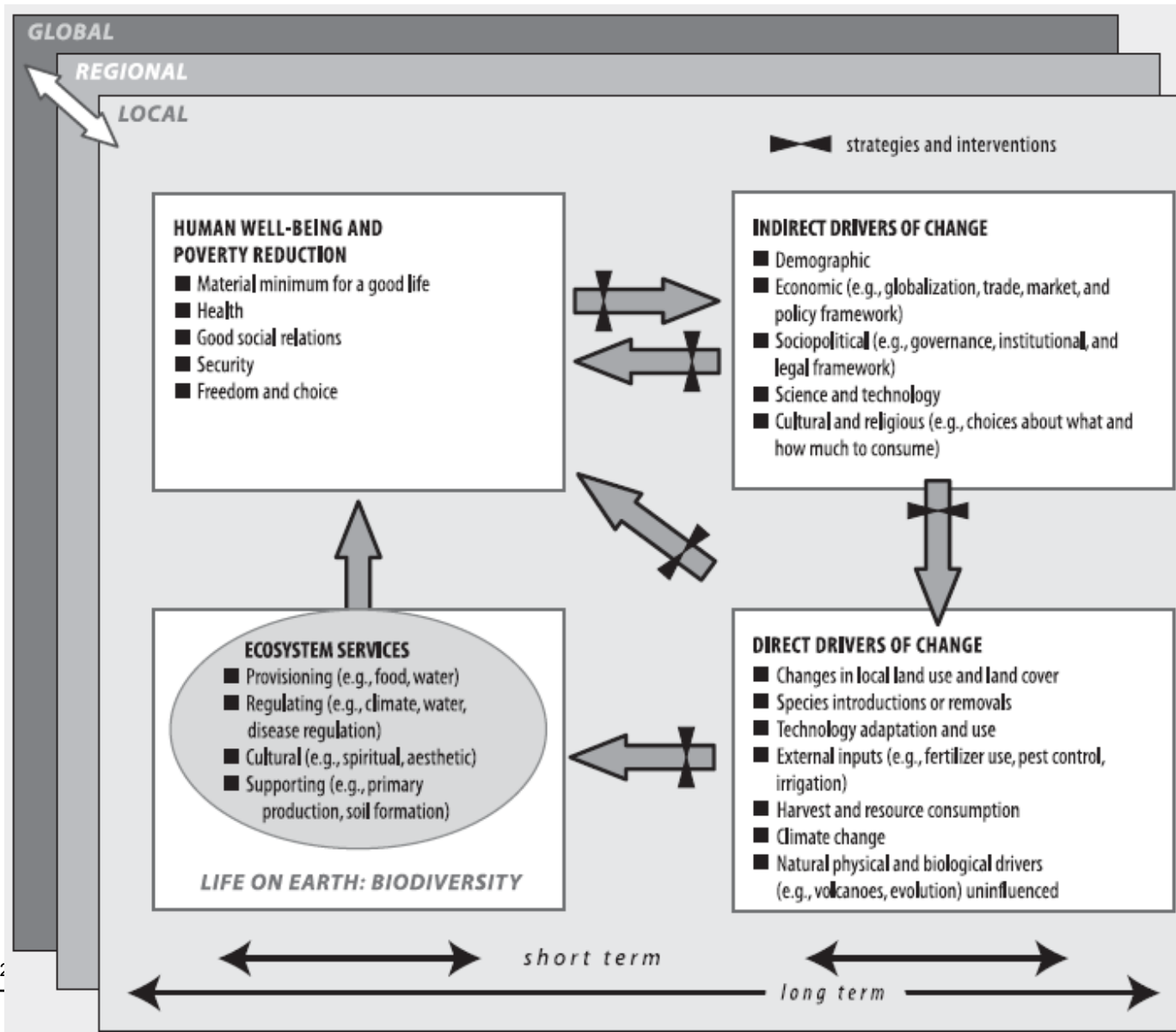
- Ecology, economy, sociology, law, philosophy

Public institutes

- Forests, water, biology, agriculture, forestry (IRSTEA, ONEMA, MNHN, FRB, CNRS, INRA, ONF, ...)

Private environment consultants

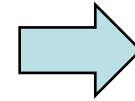
Methodological developments are based on TEEB and Millennium approaches



MEA, 2003,
Levrel, 2007,
CREDOC, 2009

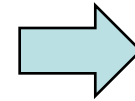
A general framework of the methodology accepted in France

Definition of ecosystems, their functions and their services



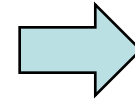
Mapping, local knowledge

Assessment of human activity impact on services and quantification of loss of human well being



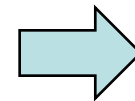
Dose response functions, environmental indicators, indicators of well being

Monetary valuation of services and/or of the variation of services due to human activity



Values to ecosystem services

Assessment of monetary impact on ecosystem services at national, regional or local scale

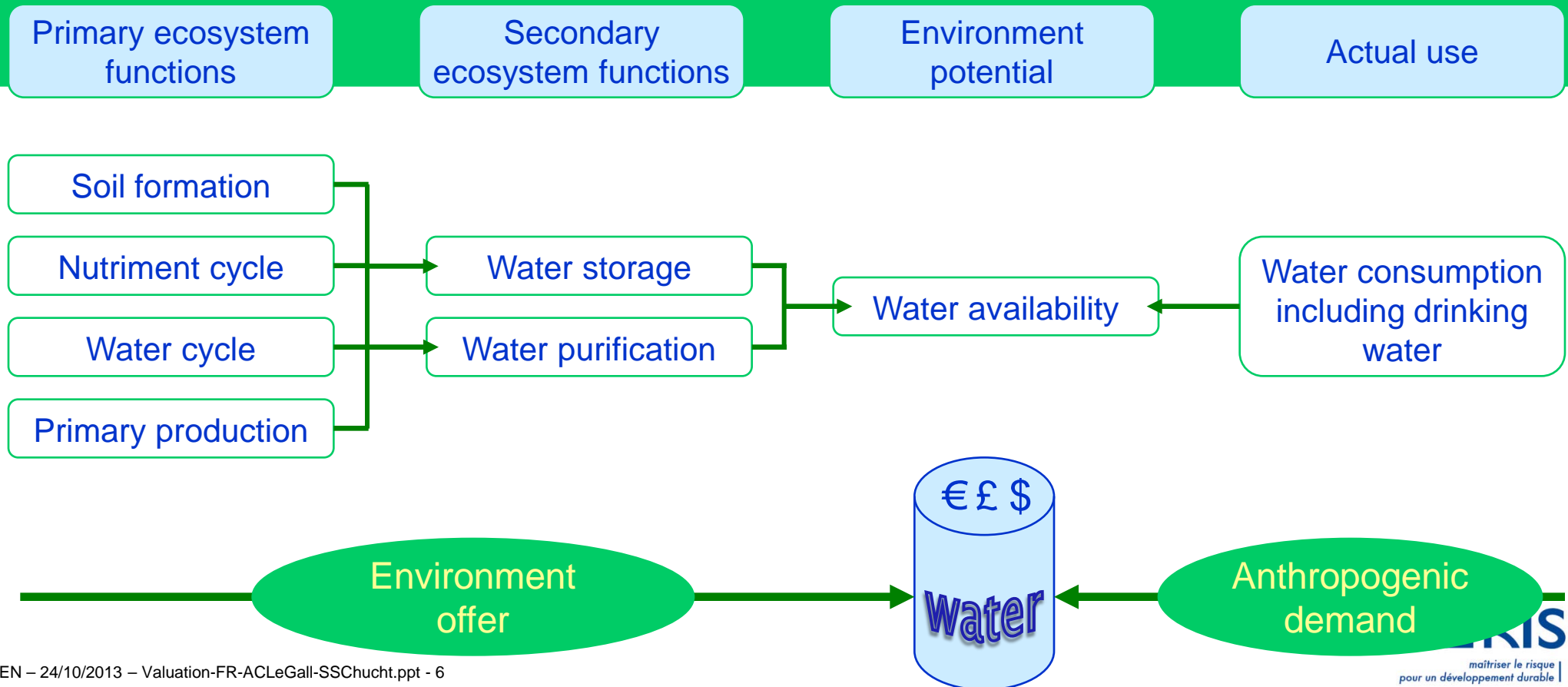


Applications to policy, impact assessments...

Most French applications are about aquatic ecosystems
(consequence of WFD...)

Ecosystems are characterised through their functions and the service(s) from an anthropo – centred point of view

Ecosystem services



Example: economic valuation of services provided by wetlands: the alluvial flood plain of La Bassée

Objective

- assess the total economic value of services provided by the wetland
- avoid double counting
- (no link to air pollution in the study)



General methodological approach to monetisation

- reference scenario = total disappearance of the wetland (in the area La Bassée)
- choice of monetisation method(s) amongst the “most relevant” ones
- results expressed in ranges of values (per person, per hectare, for the wetland overall)

Prerequisites to monetisation of wetland services

- delimitation of the site studied
- identification, ranking, characterisation and quantification of the services provided by the wetland
- characterisation of anthropic uses depending on the wetland and their (beneficial or detrimental) relation to the wetland

Different monetisation approaches within the study to reach a global value: some examples

Service	Use/activity	Quantification	Value of the ecosystems services/year (price base: €2010)	Valuation method	Use /non-use
Regulating services	Water purification: drinking water supply	Abstraction benefitting from purifying capacity of La Bassée	4.1 – 12.2 M€	Treatment costs	Use
Provisioning services	Forestry production	Poplar plantation (600 ha)	0.2 M€	Economic value of (net income from) poplar production	Use
Cultural services	Non-professional fishing	Approximately 6000 fishermen	1.7 – 2.1 M€	<u>Expenditure:</u> material, accommodation, transport, fishing license) <u>Value transfer:</u> revealed preference study and transport cost approach: estimate of loss in well-being for fisher due to water quality degradation used as proxy for wetland degradation	Use
Total economic value: 11-58 million € without and 17-86 million € with biodiversity					
Biodiversity	Biodiversity	206 bird species, 34 mammal species, 684 plant species	6 – 30.3 M€	Value transfer from different declared preferences (contingent valuation) studies	Non-use

Authors point out potential methodological caveats and limits of their approach

Combining different monetisation methods

- not considered as problematic in the study
=> reasoning: primarily methods based on costs, only to a lesser degree value transfers from contingent valuations and choice experiments

Approaches to the avoidance of double counting in Total Economic Value (TEV)

- choice of one method where different approaches were tested

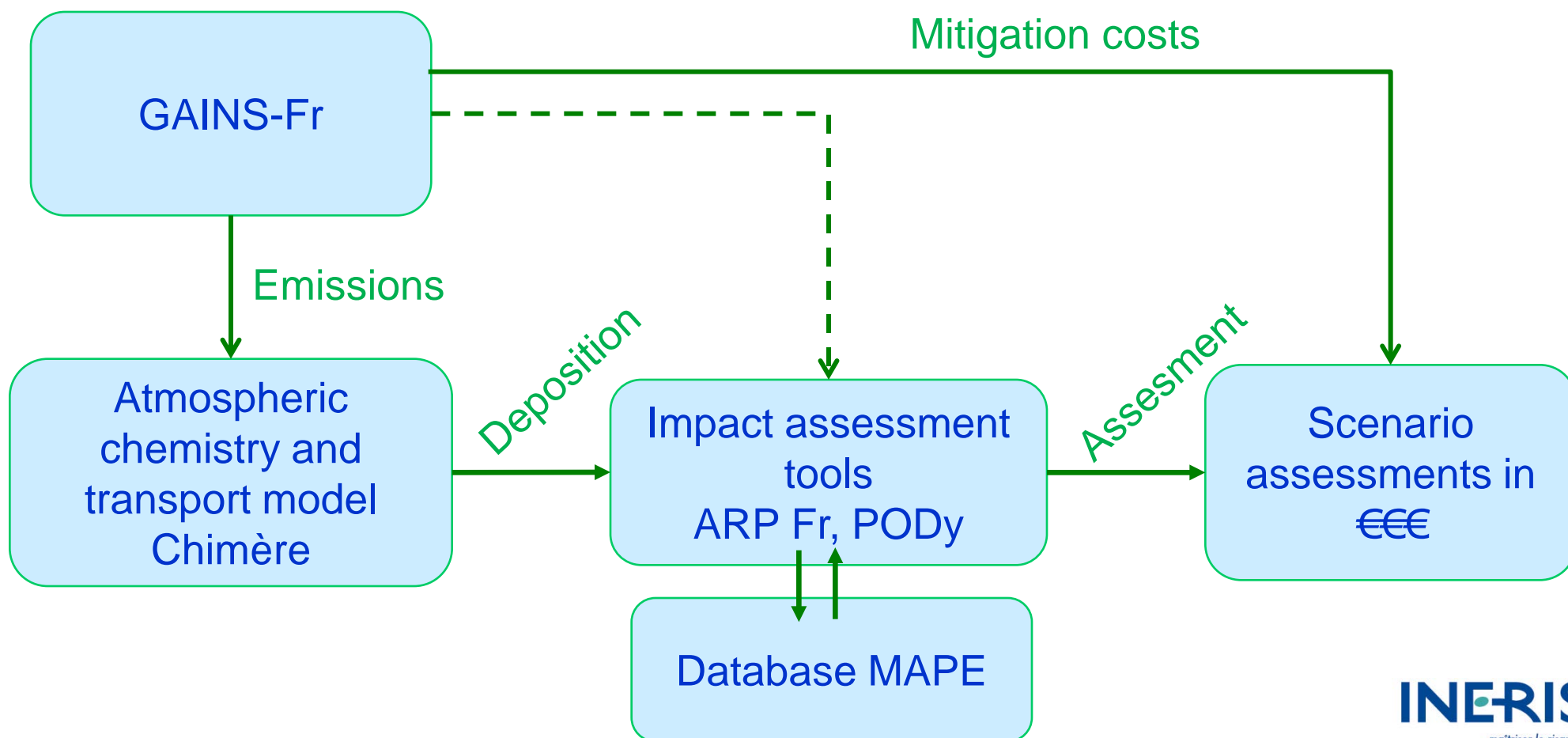
Uncertainties in economic valuation

- reflected by value ranges
- especially important for value transfer in estimate of non-use value of biodiversity
=> presentation of TEV with and without non-use value of biodiversity

Other uncertainties

- not all services completely assessed (e.g. carbon storage only of peatland, not of other wetland types)
- C storage included, methane emissions from wetlands excluded
- choice of population and economic activities considered as benefitting from services

INERIS modelling chain responds to an Environment Ministry request for an assessment of costs and benefits (for ecosystems and health) of air pollution scenarios



The « Monetisation of Air Pollution Effects on health and ecosystems » database (MAPE DB made in INERIS)

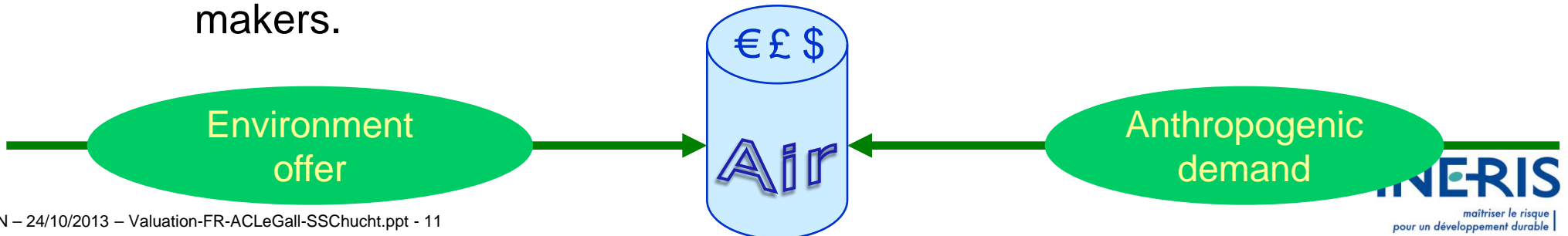
Overall long term aims for the database

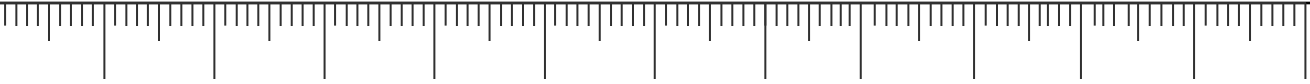
- Compile ecosystem services by environment compartment (air, soil, water...)
- Compile relevant dose response functions affecting each service
- Compile monetary values for services or services changes
- Compile further information necessary to calculate monetary indicators
- Link with literature references

Just started

Practical approach

- Use data available in the literature (no attempts to develop functions, focus on search for alternative values)
- Focus on sets of indicators useful to answer questions asked by policy makers.





A beneficial side effect of monetisation is to build a discussion framework between scientific community, stakeholders and policy makers

Especially as long as there is no consensus on values, monetisation contributes to:

- Inform
- Discuss
- Reach a consensus between different options

Monetisation is one multicriteria analysis in which all criteria are measured with the same unit: €.

Other multicriteria approaches exist that may help when economic valuation is not possible.

Further needs so that ecosystems valuations are used more systematically in policy

So far, preliminary studies have not been translated into systematic assessments for policy in France.

A better acceptance of the methods requires:

- Better understanding of values (definition, assessment methods, applications)
 - ⇒ Consensual robust approaches
 - ⇒ Values for a greater number of services
- +
- Development of management tools that use biodiversity valuation
- Better understanding how society validates the values through policy and law



Thank you

Litterature references

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- Levrel, H. (2007). Étude de faisabilité pour la réalisation d'un millenium ecosystem assessment en France, 47 p, Muséum National d'Histoire Naturelle (MNHN), Paris, France.
- MEA (2003). "Ecosystems and Human Well-being: A Framework for Assessment," Island Press

Synthesis of the study: approaches chosen and results (1/2)

Service	Use/activity	Quantification	Value of the ecosystems services/year (price base: € 2010)	Valuation method	Use /non-use	Population concerned	Surface (ha)
Regulating services	Flood retention	Volume of water stored	2 – 37 M€	Replacement costs (construction & operation of a dam and/or zone of water storage)	Use	1.6 million inhabitants in the floodable area	9,632
	Aquifer recharge	Current abstraction	0.4 – 0.9 M€	Costs: abstraction fee for users as proxy for value of water (0.02 – 0.06/m ³)	Use	37,000 households	12,878
	Water purification: purification function	Denitrification = 200 kg par hectare et par an	41 – 62 M€	Cost for substitution of service: cost for treatment of excess nitrogen in water resources (70 – 106 €/kg)	Use	29,000 households in adjacent municipalities, 37,000 supplied by drinking water, 6,000 fishermen	8,585
	Water purification: drinking water supply	Abstraction benefitting from purifying capacity of La Bassée	4.1 – 12.2 M€	Replacement costs: additional nitrate treatment of drinking water (0.4 – 0.6 €/m ³)	Use	37,000 – 1 million households	12,878
	Climate regulation	158,000 tonnes of CO ₂ stocked in peatland	0.2 M€	Market price (32€/ t de CO ₂ , 4% discount rate)	Use	World population	113
Provisioning services	Agriculture production	Pasture (1500 ha) Tonnes of dry matter from grassland (7,500 – 12,000/year) Arab:e land (6000 ha)	0.4 – 0.5 M€	Gross margin for pastures (285 – 305 €/ha)	Use	farmers	1,500
	Forestry production	Poplar plantation (600 ha)	0.2 M€	Economic value of (net income from) poplar production (max. 270€/ha)	Use	Farmers	600

Synthesis of the study: approaches chosen and results (2/2)

Service	Use/activity	Quantification	Value of the ecosystems services/year (price base: € 2010)	Valuation method	Use /non-use	Population concerned	Surface
Cultural services	Hunting	1000 – 1600 hunters in the territory	1.3 – 2 M€	Expenditure for material, transport, accommodation ... (1,250€/hunter/year) No estimate of well-being for hunter due to wetland	use	1000 – 1600 hunters	12,878
	Non-professional fishing	Approximately 6000 fishermen	1.7 – 2.1 M€	<u>Expenditure</u> material, accommodation, transport (208-270/fisher/year); fishing license (49€/year); <u>Value transfer</u> (revealed preference study, transport cost approach) estimate of loss in well-being for fisher due to water quality degradation (20€/fisher/year) as proxy for wetland degradation	Use	6,000 fishermen	12,878
	Educational and scientific value	Approx. 200 people have profited from educational activities; requires 80% of a full time position	0 M€ 0.4 – 0.5 M€	Wage for educational activity (21,000 €/year) but provided for free (no market value); Value transfer from a choice experiment (WTP for increased use of educational and scientific potential of wetland = 8-9€/person questioned)	Use & non-use	200 beneficiaries of activities currently; 52,000 inhabitants > 18 years of adjacent municipalities	855
Biodiversity	Biodiversity	206 bird species, 34 mammal species, 684 plant species	6 – 30.3 M€	Value transfer from different declared preferences (contingent valuation) studies (6.3 – 31.7 €/household)	Non-use	960,000 households	12,878

Total economic value: 11-58 million € without and 17-86 million € with biodiversity