Cultural Services and Human Well-being

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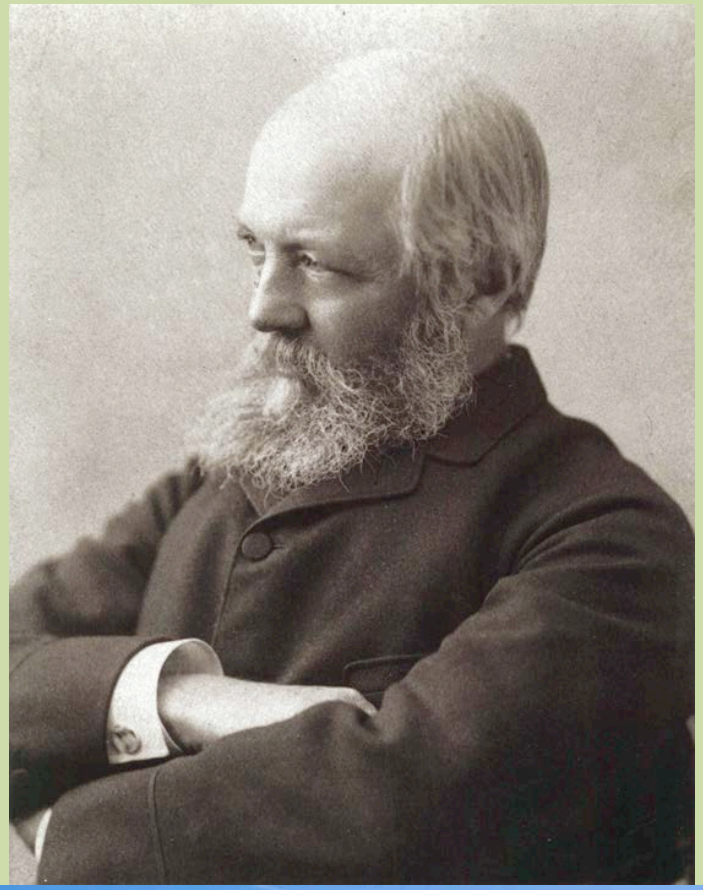
DOURO Sustainable Territorial Development and Healthy Lifestyles, June20th 2016

Presentation guideline

- Introduction
- Ecosystem services
- Evaluation examples
- Conclusions

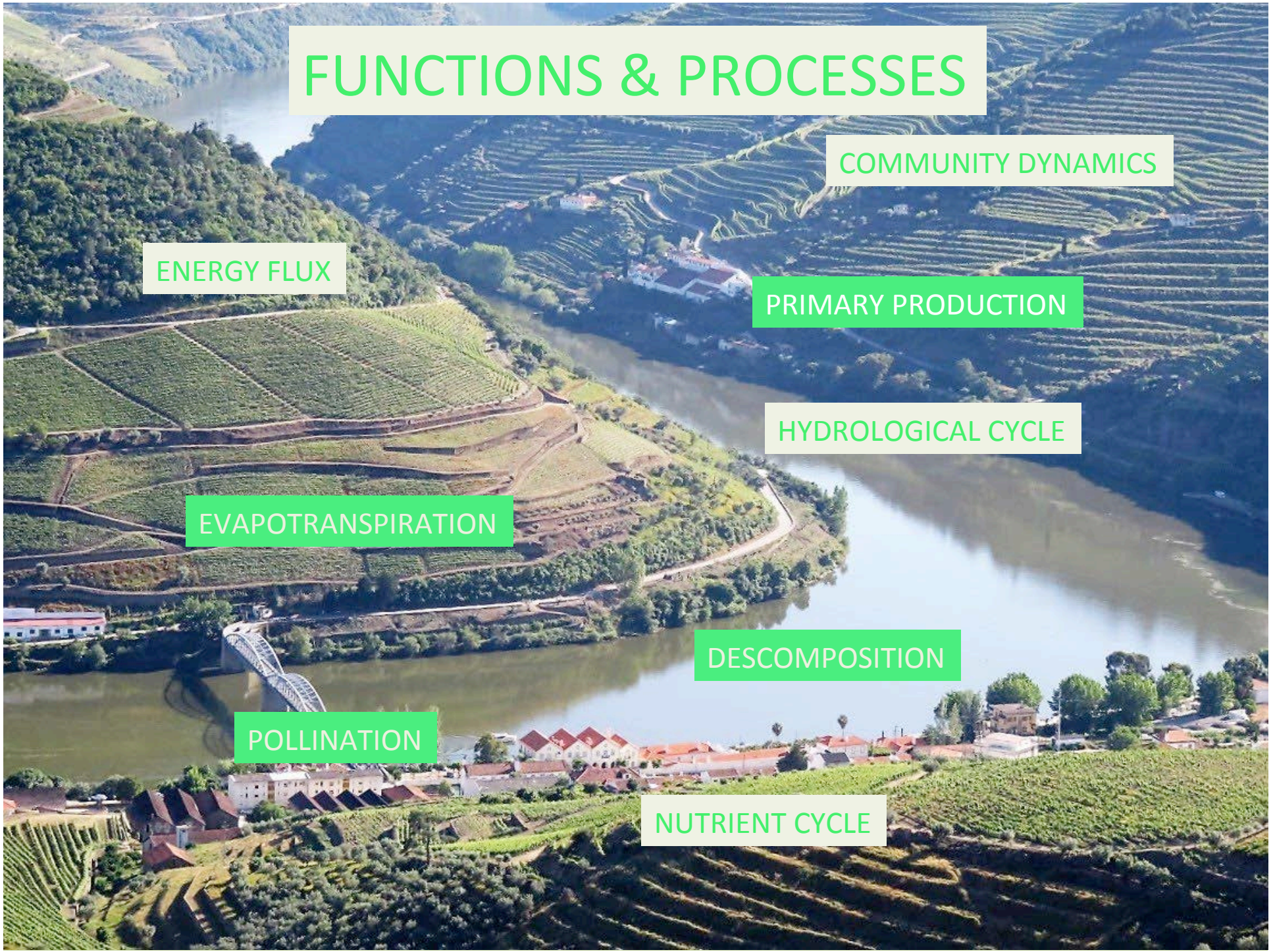


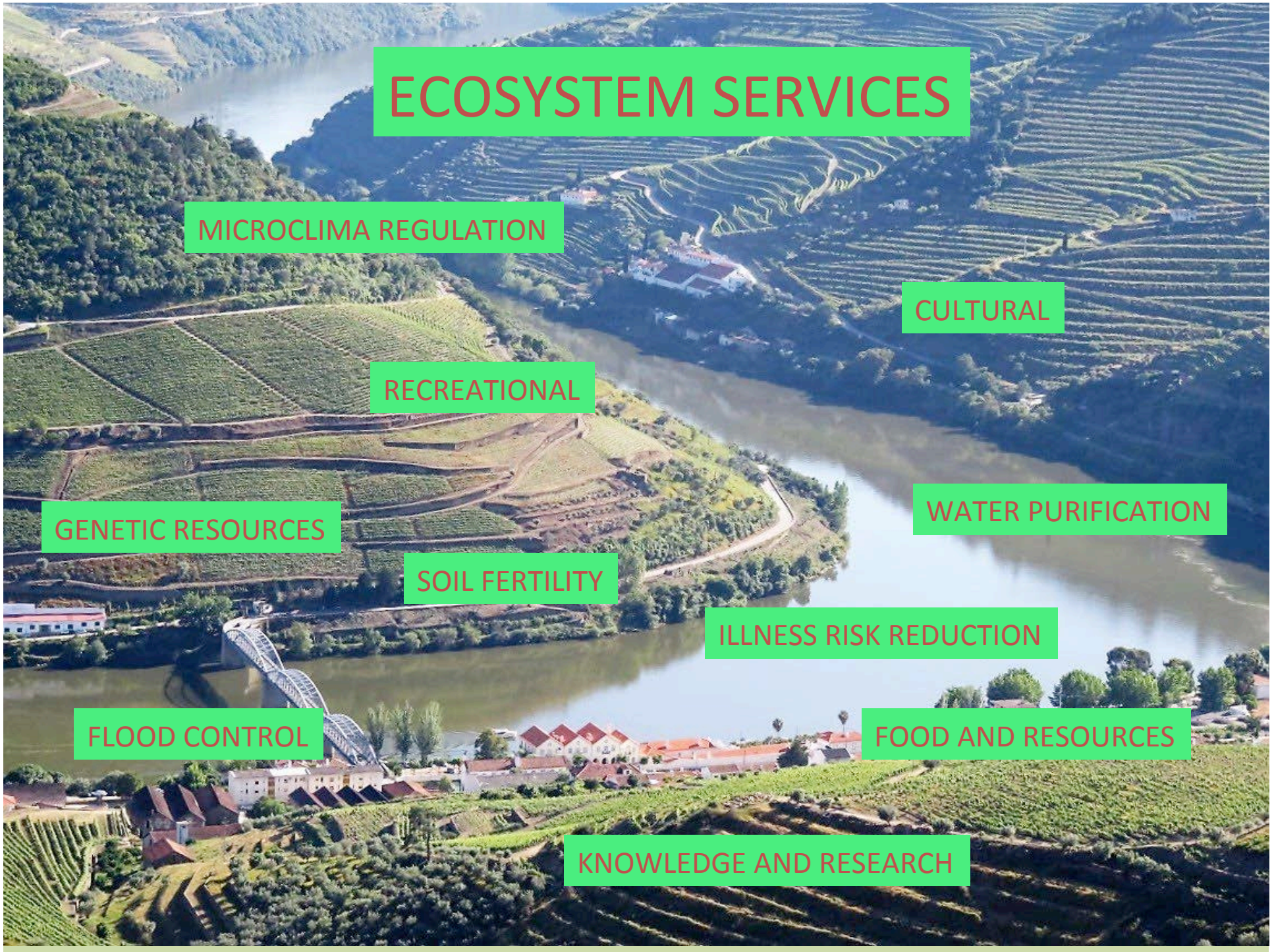
Frederick Law Olmsted Sr.
Landscape Architect, Author, Conservationist
(1822–1903)

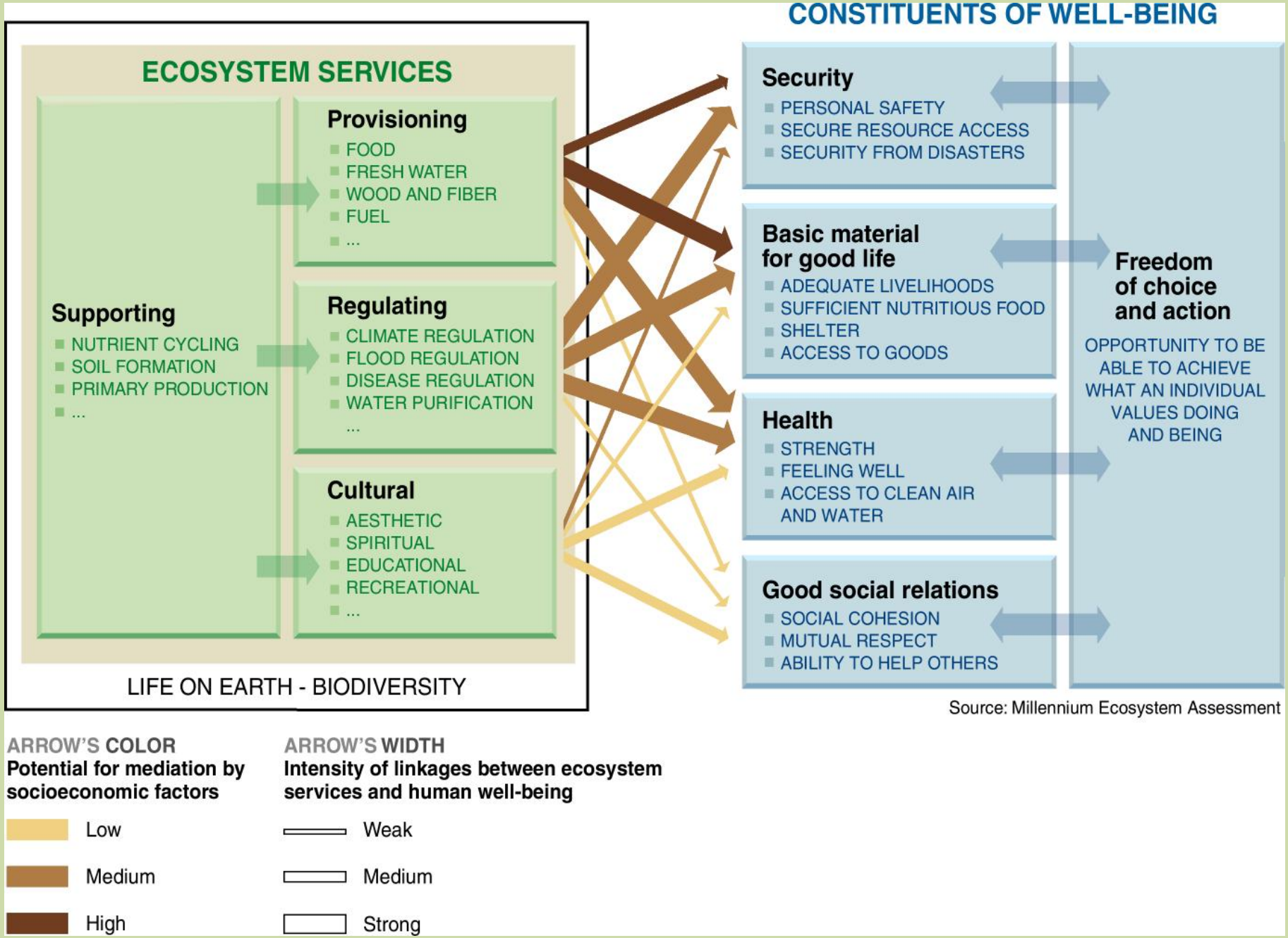
Cyrus II The Great,
of Persia 576 -530 B.C.

“I have seen persons of emotional temperament stand with tearful eyes, spellbound and dumb with awe, as they got their first view of the Valley from Inspiration Point, overwhelmed in the sudden presence of the unspeakable, stupendous grandeur.”

– Galen Clark, guardian of the Yosemite Grant


FUNCTIONS & PROCESSES
COMMUNITY DYNAMICS
ENERGY FLUX
PRIMARY PRODUCTION
HYDROLOGICAL CYCLE
EVAPOTRANSPIRATION
DESCOMPOSITION
POLLINATION
NUTRIENT CYCLE


ECOSYSTEM SERVICES
MICROCLIMA REGULATION
CULTURAL
RECREATIONAL
WATER PURIFICATION
GENETIC RESOURCES
SOIL FERTILITY
ILLNESS RISK REDUCTION
FLOOD CONTROL
FOOD AND RESOURCES
KNOWLEDGE AND RESEARCH



Source: Millennium Ecosystem Assessment

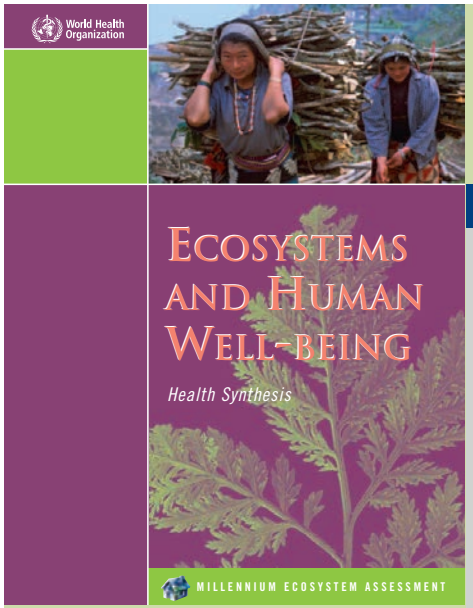
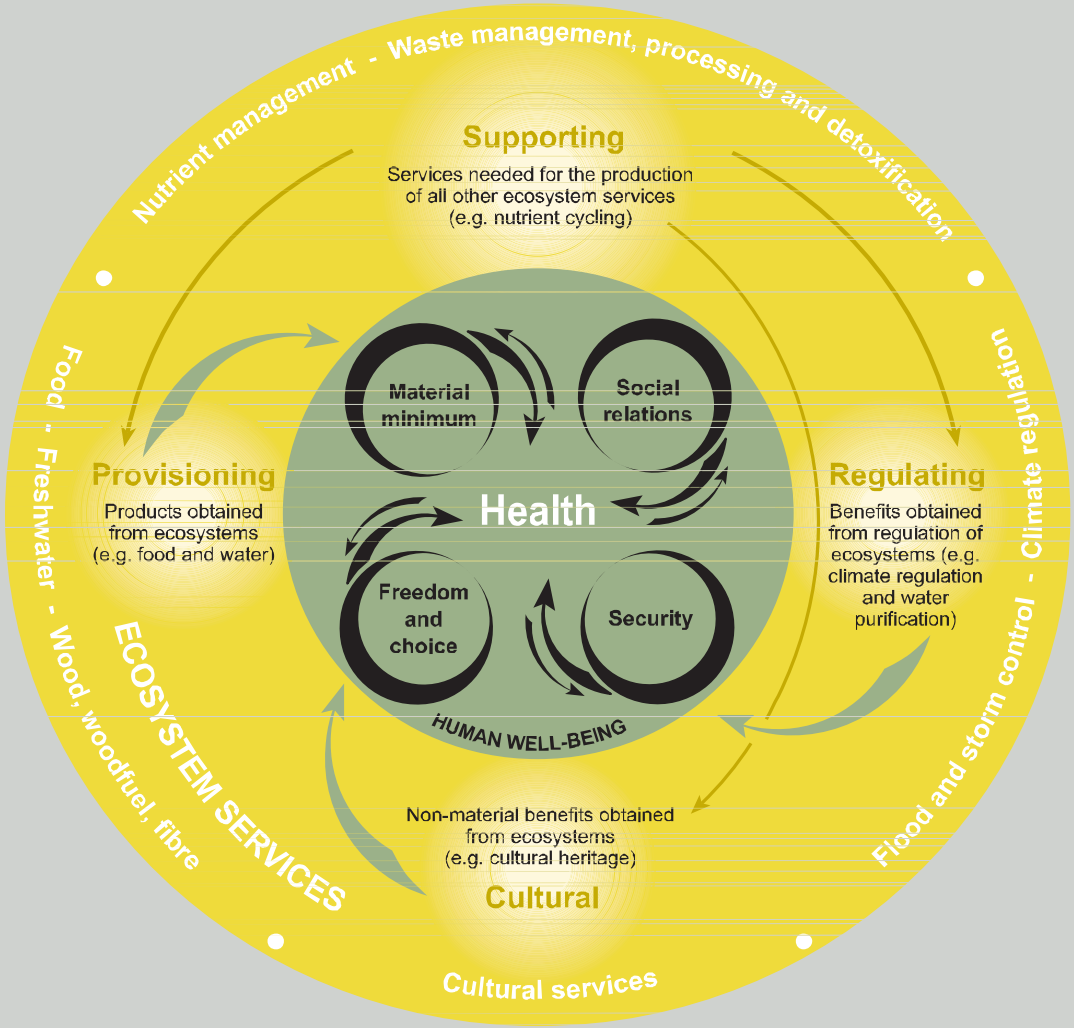
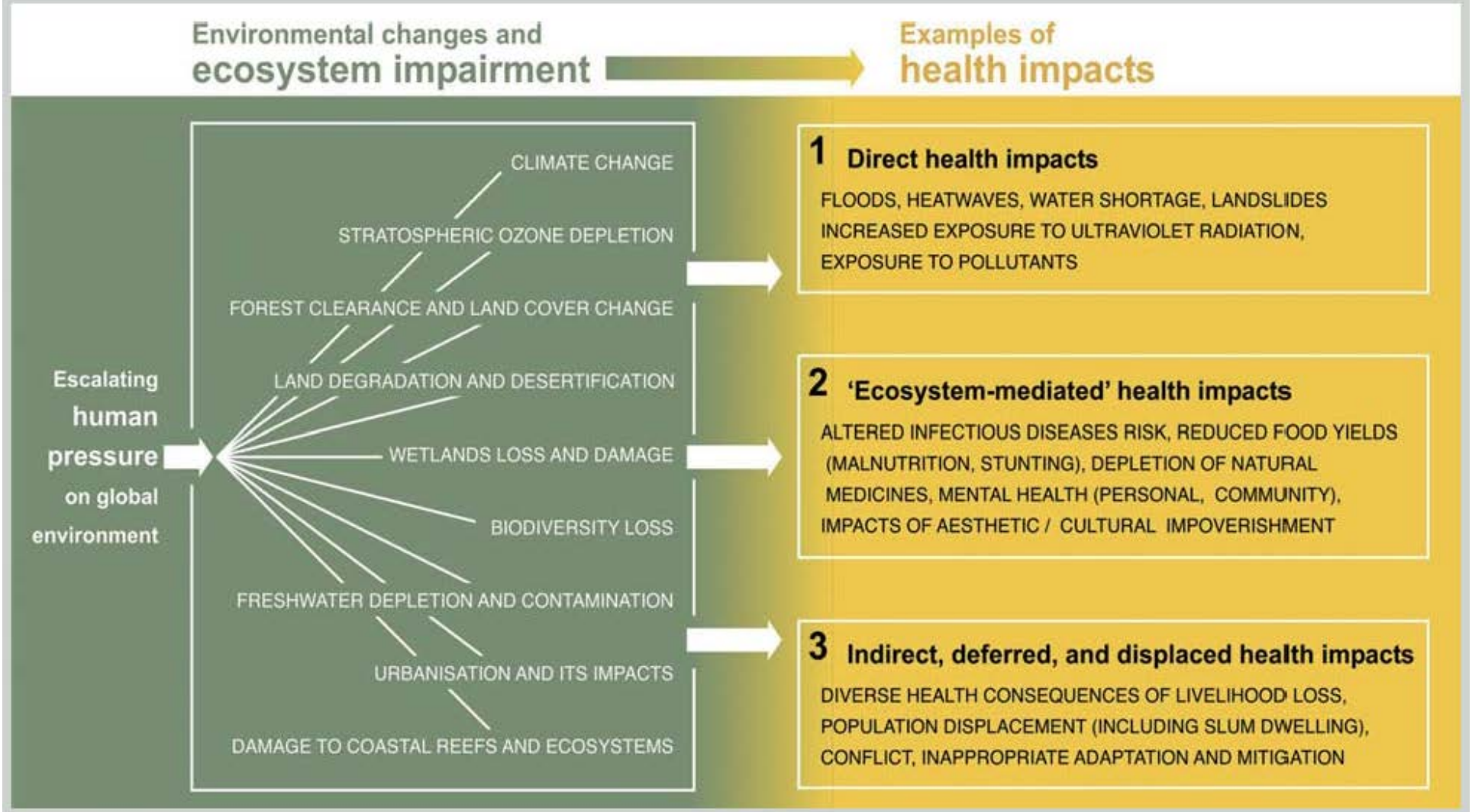


Figure 1.2 Associations between health, other aspects of human well-being and ecosystem services (R 16 Figure 16.1)

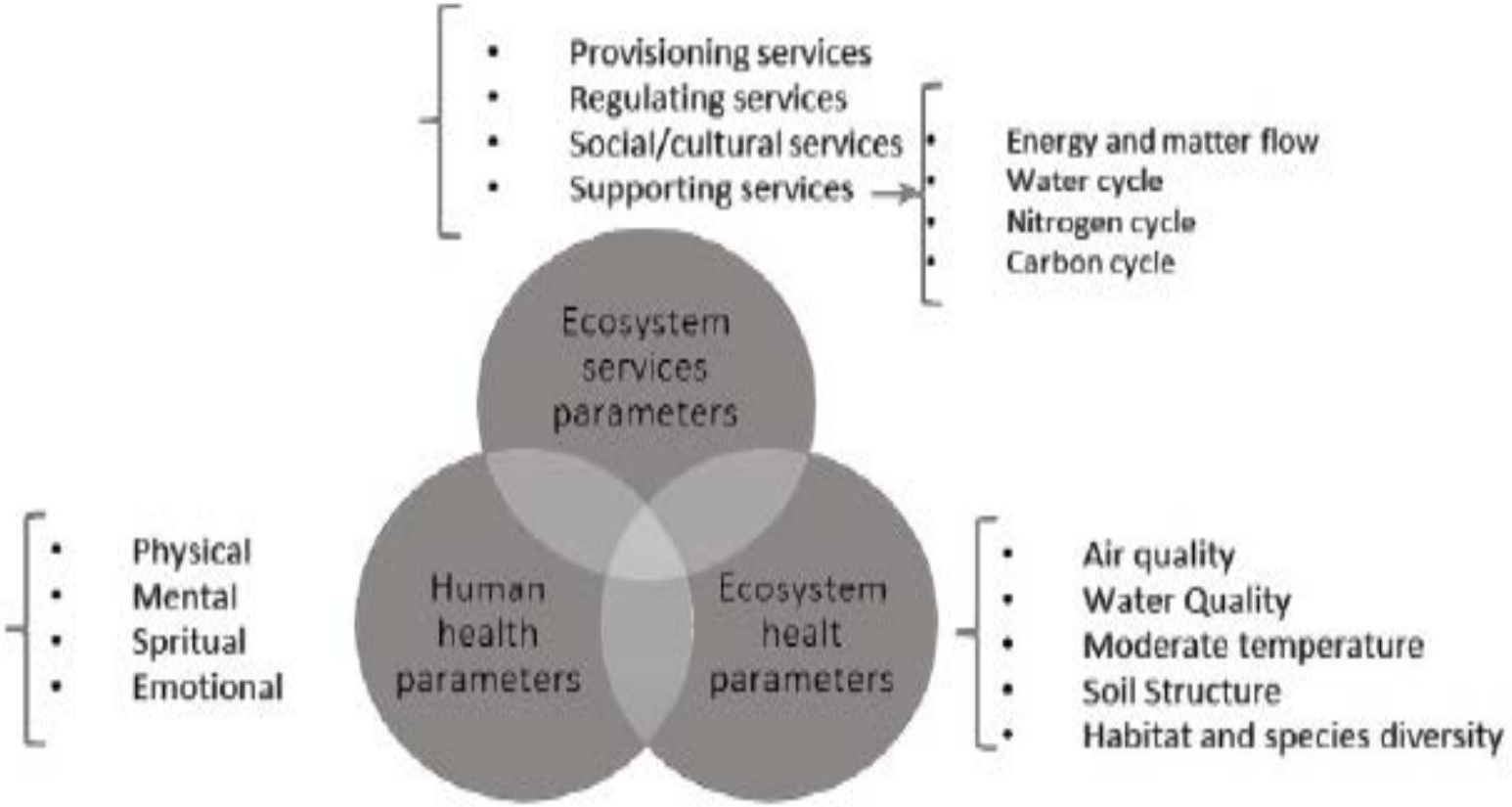


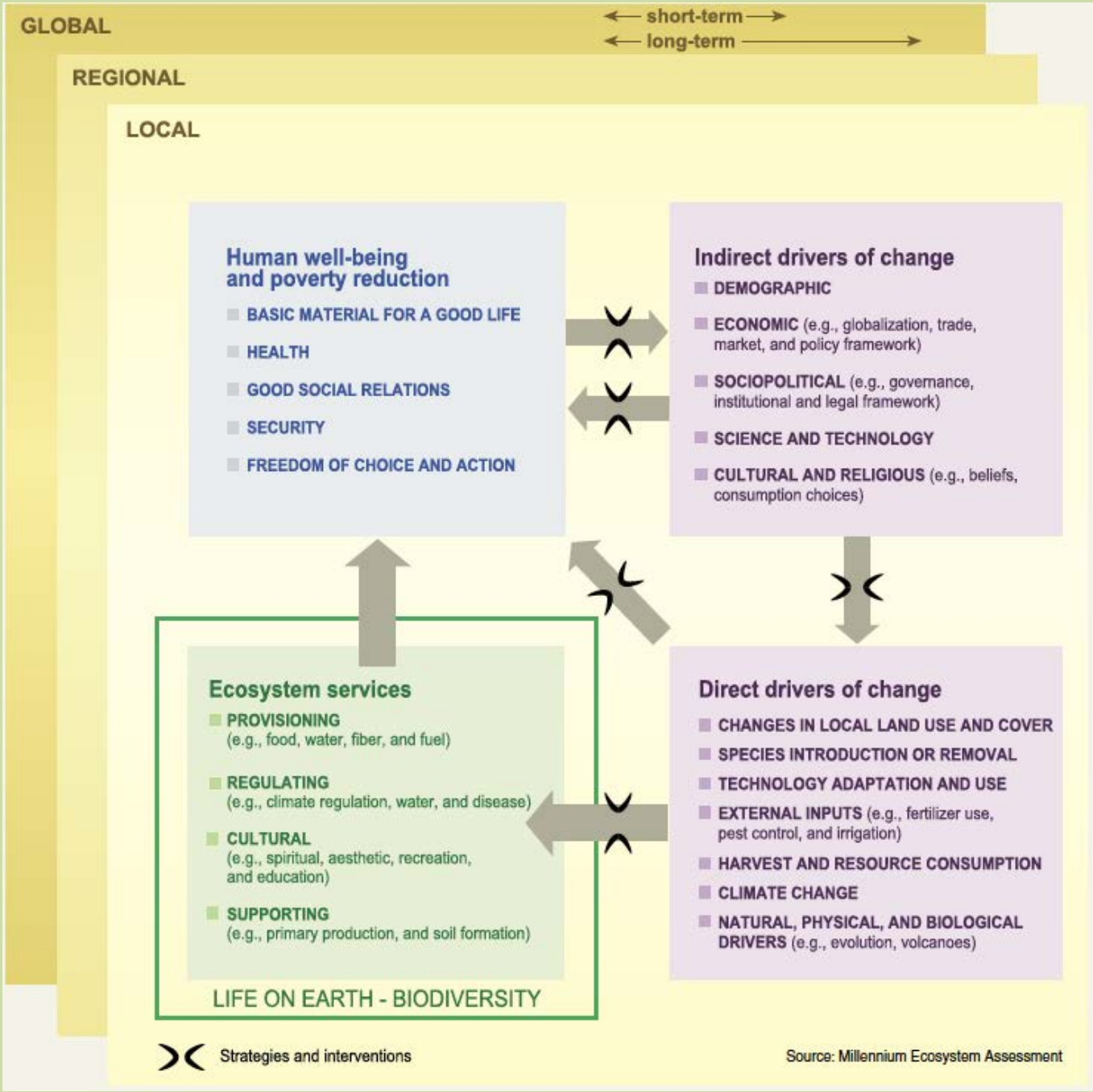
The MA identifies five main aspects of human well-being. This diagram makes health the central aspect. Human health is affected directly and indirectly by changes in ecosystems but also is affected by changes to other aspects of well-being. Lack of aspects of human well-being (i.e. material minimum, good social relations, security, freedom and choice) all can have health impacts. Health also can influence these other aspects of human well-being.



Ecosystems and Human Well-being: Health Synthesis

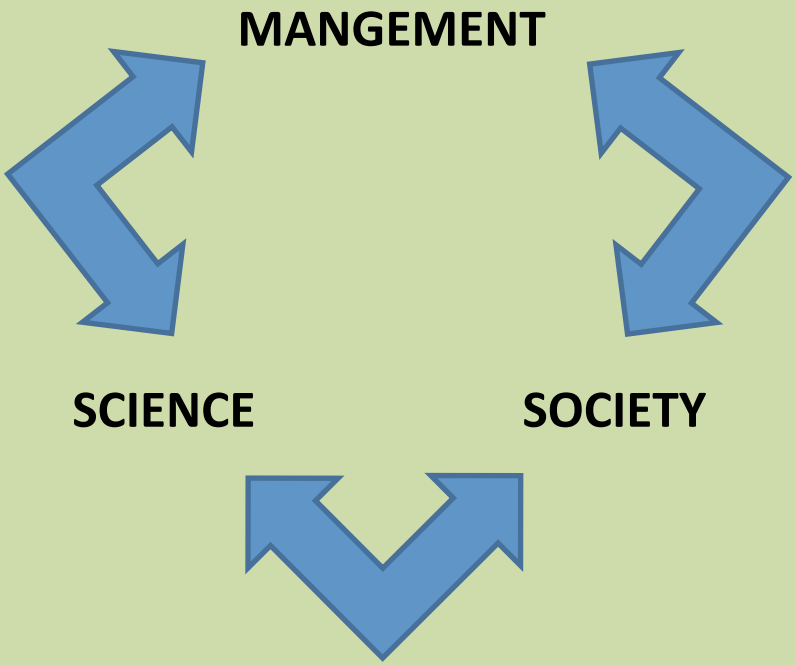
Parisa Pakzad and Paul Osmond / Procedia - Social and Behavioral Sciences 216 (2016) 68 – 79




GLOBAL
short-term
long-term
REGIONAL
LOCAL
Human well-being and poverty reduction
BASIC MATERIAL FOR A GOOD LIFE
HEALTH
GOOD SOCIAL RELATIONS
SECURITY
FREEDOM OF CHOICE AND ACTION
Indirect drivers of change
DEMOGRAPHIC
ECONOMIC (e.g., globalization, trade, market, and policy framework)
SOCIOPOLITICAL (e.g., governance, institutional and legal framework)
SCIENCE AND TECHNOLOGY
CULTURAL AND RELIGIOUS (e.g., beliefs, consumption choices)
Ecosystem services
PROVISIONING (e.g., food, water, fiber, and fuel)
REGULATING (e.g., climate regulation, water, and disease)
CULTURAL (e.g., spiritual, aesthetic, recreation, and education)
SUPPORTING (e.g., primary production, and soil formation)
LIFE ON EARTH - BIODIVERSITY
Direct drivers of change
CHANGES IN LOCAL LAND USE AND COVER
SPECIES INTRODUCTION OR REMOVAL
TECHNOLOGY ADAPTATION AND USE
EXTERNAL INPUTS (e.g., fertilizer use, pest control, and irrigation)
HARVEST AND RESOURCE CONSUMPTION
CLIMATE CHANGE
NATURAL, PHYSICAL, AND BIOLOGICAL DRIVERS (e.g., evolution, volcanoes)
Strategies and interventions
Source: Millennium Ecosystem Assessment

Biodiversity for Human well-being

Ecosystem Service Framework provides a space for coordination and dialogue between scientist, managers/politicians and Stakeholders



INTEGRATIVE, ADAPTATIVE MANAGEMENT➔ RESILIENT LANDSCAPE

World Health Organization

- Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.

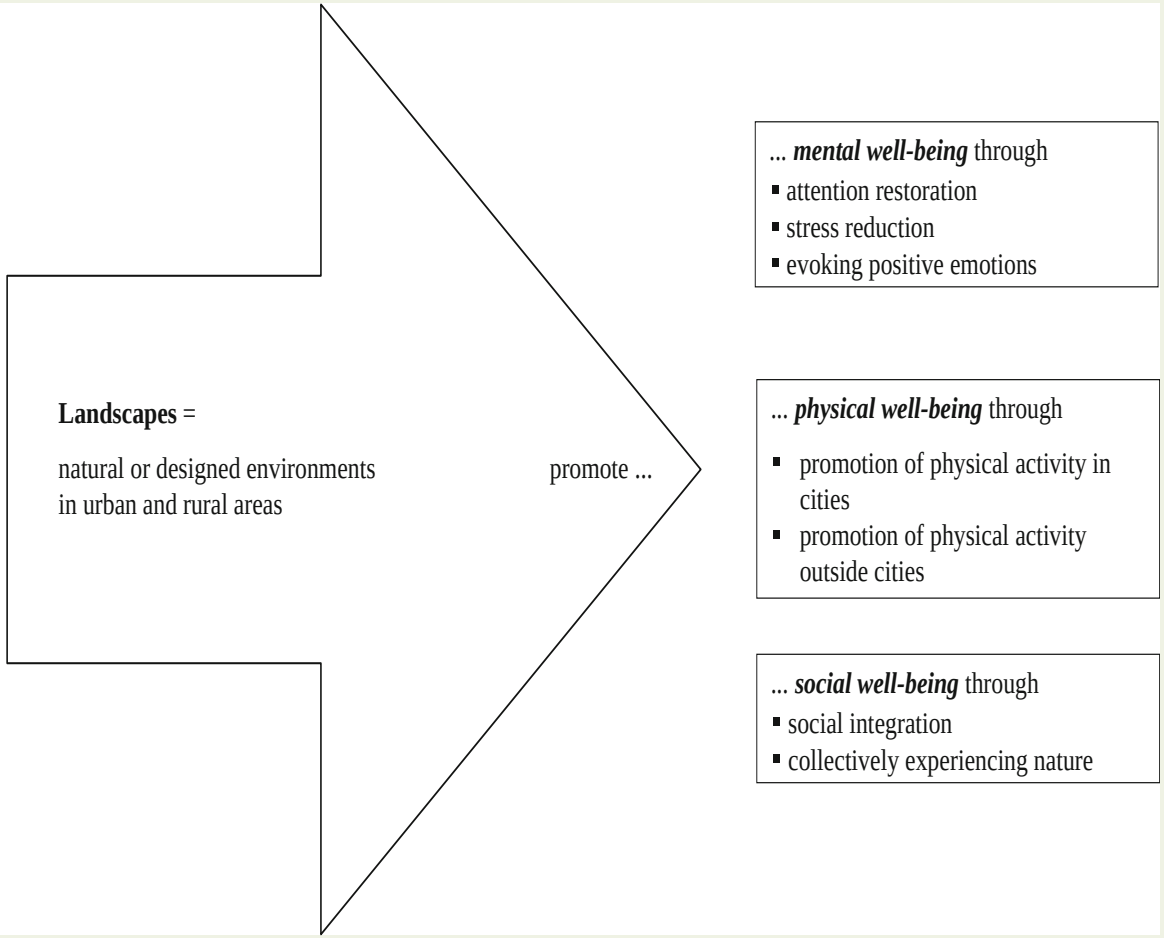


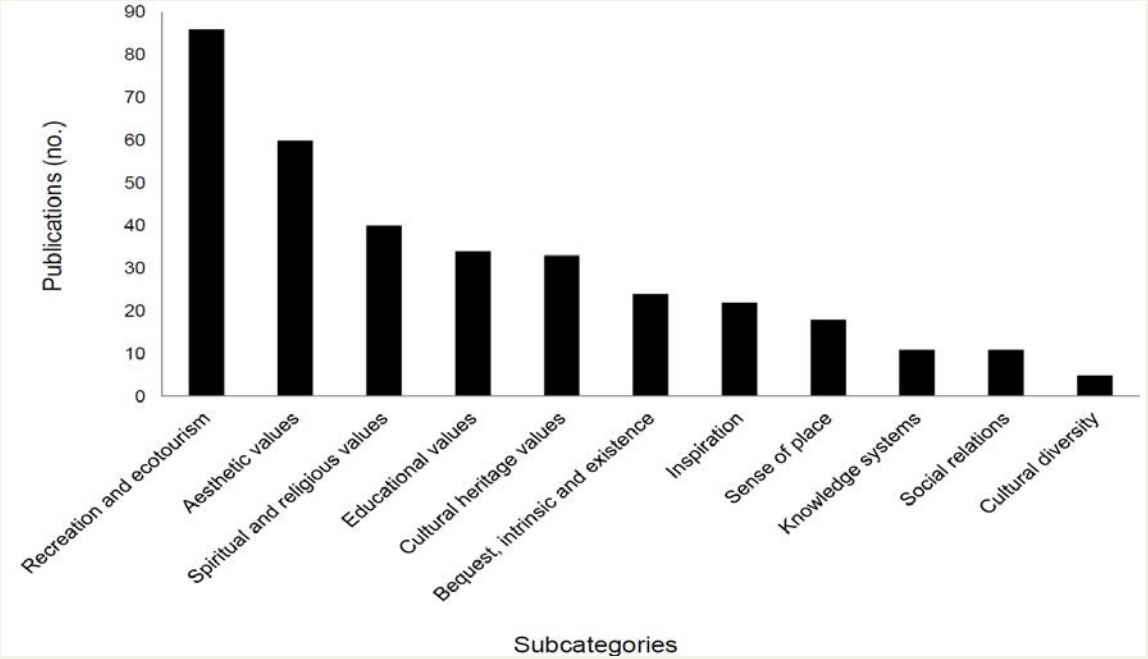
Fig. 1 Heuristic framework on the health-promoting impact of landscape

CULTURAL ECOSYSTEM SERVICES

Non-material benefits people obtain from ecosystems through spiritual enrichment, cognitive development, reflection, recreation and aesthetic experience (MA 2003)

Ecology and Society **18**(3): 44
http://www.ecologyandsociety.org/vol18/iss3/art44/

Fig. 3. Number of publications investigating different subcategories of cultural ecosystem services. Publications could have no entries or multiple entries if, respectively, no or multiple subcategories were addressed.

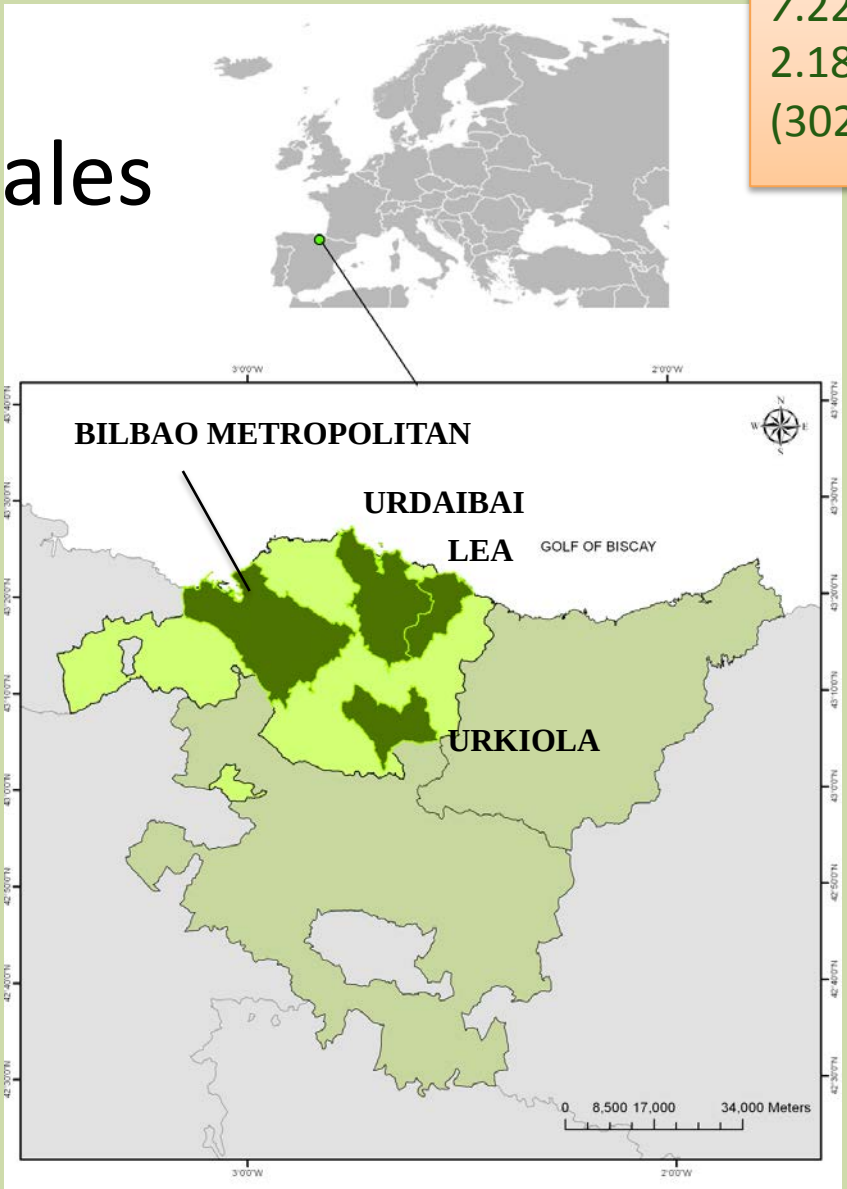


Cultural services

- A tool to bridge gaps between academic disciplines and research communities
- Capitalizing social relevance of CS solve real-world problems
- Potential to foster new conceptual links between alternative logics relation to a variety of social and ecological issues

Study area

Different working scales



The Basque Country
7.229 km²
2.18 M Inhabitants
(302 Inhab/km²)

Bizkaia
2.216 Km²
1.151.113 Inhab.
(520 Inhab/km²)
111 towns

Urdaibai
252 Km² (11,38%)
44.557 Inhab
(177 Inhab/Km²)
17 towns

Example:

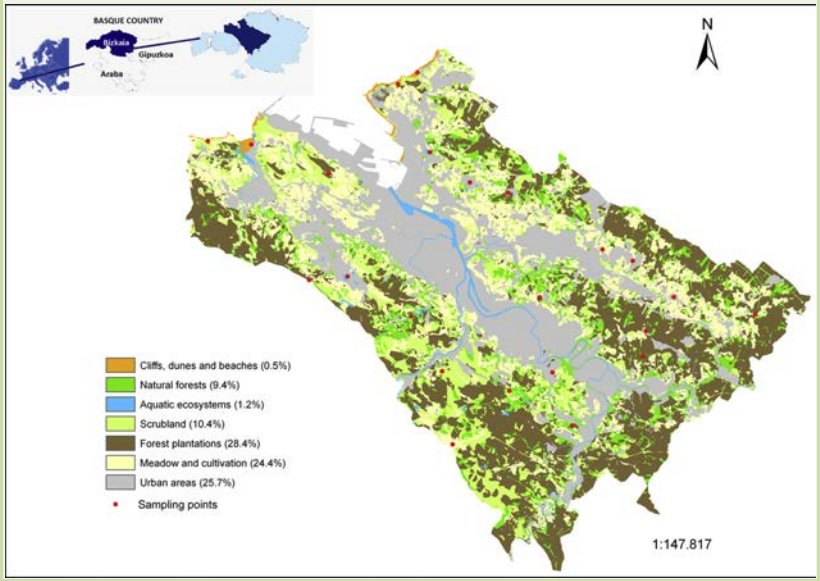
Social perception, demand and mapping in Bilbao Metropolitan

- **Mapping of services:** recreation and aesthetic services

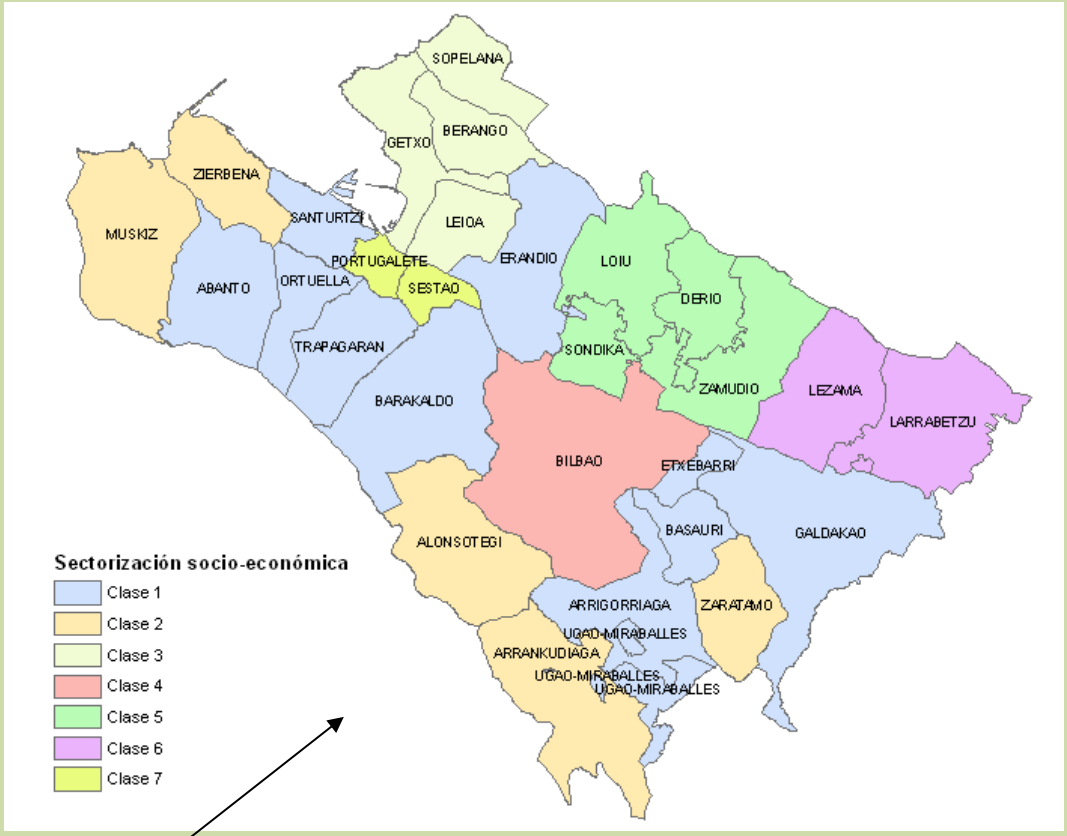
- **Social perception:** direct in-person questionnaires (545)

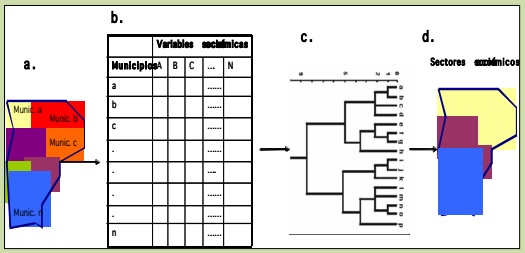
  Randomly selected population at different sites in the BMG

  Specific groups of interest: e.g. teachers, university researchers and students, public-administration technicians and people from environmental associations



Socio-economic division





- Socio-economic study
- Land-uses

Results

1. Differences between the **perception** and **demand**

Table 2
Percentages of people who indicated each ES when they were asked about the benefits supplied by the BMG, when they had to choose the five most important services from those presented in the photo-questionnaire, and the percentages of people who would contribute to the maintenance of particular ES (demand).

Ecosystem services	Open question (%)	Photo-questionnaire				Demand (%)
		Mean score	Standard error	%	% Most important	
Cultural services	79.2	1.218	0.028	97.6	46.6	75
Tourism and recreation	71.8	1.568	0.084	49.2	12.2	21.2
Aesthetic value	9.6	0.936	0.068	35	4.4	15.8
Existence value of biodiversity	9	2.356	0.084	71.6	18	44.6
Environmental education	2.2	1.362	0.078	46.4	8.8	33.2
Cultural heritage	2	0.826	0.062	32.6	2.6	14.4
Scientific value	0.2	0.260	0.037	12	0.6	6.4
Regulating services	31.4	1.393	0.038	90.6	39	45
Air purification	26.4	2.170	0.089	63.2	18.6	23.8
Climate regulation	0.8	1.372	0.081	44.8	10.4	22.6
Water regulation	0.4	1.276	0.077	42.2	6.2	18.6
Soil formation	0.2	0.754	0.062	29.4	3.8	14.8
Provisioning services	1.8	0.991	0.053	52.2	14.4	24.8
Food and material provision	1.6	0.870	0.071	30.2	8	15.2
Water provision	0.4	1.112	0.077	33.2	6.4	14.2

Casado et al., 2013. *Journal of Environmental Management* 129:33-43

2. Perception depending on: **Socio-cultural** and **attitudinal** factors and type of ecosystem.

Table 5
Percentages of people who demanded each ES, analysed through a chi-square test, by user group.

Ecosystem services	People without an environmental attitude	Weekend trippers	Strollers and sportsmen/women	Nature users	Specialists	χ^2 (user groups)
Cultural services	77.2	73.3	73.5	71.9	81.8	2.706
Existence value of biodiversity	47.4	39.8	46.1	50	51.9	4.374
Environmental education	26.3	29.9	30.9	34.4	50.6	13.171**
Tourism and recreation	29.8	21.7	22.1	21.9	11.7	6.810
Aesthetic value	15.8	13.6	23.9	9.4	12.9	7.838*
Cultural heritage	14.1	14.1	15.9	0	19.5	7.241
Scientific value	10.5	2.7	3.5	3.1	19.5	30.739***
Regulating services	52.6	38.5	41.6	46.9	62.3	15.086**
Climate regulation	17.5	20.4	17.7	31.3	36.4	12.725**
Air purification	35.1	17.6	23.9	25	32.5	11.834**
Water regulation	12.3	17.2	17.7	25	25.9	5.483
Soil formation	14.1	8.6	12.4	25	32.5	28.991***
Provisioning services	26.3	24.4	23.9	15.6	29.9	2.642
Water provision	24.6	12.7	11.5	12.5	15.6	6.318
Food and material provision	12.3	15.8	15.9	6.3	18.2	3.013

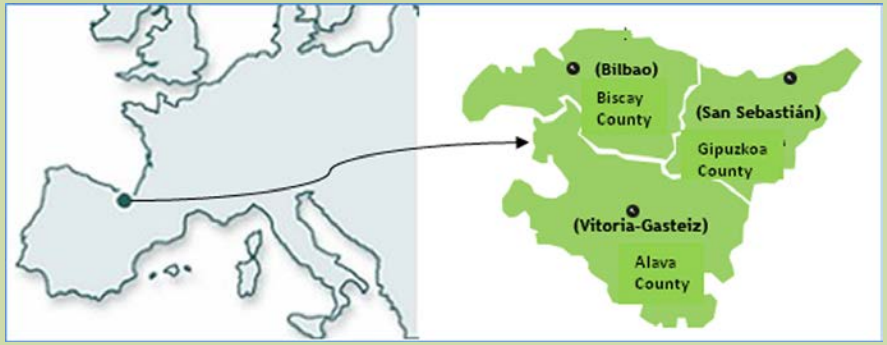
*Significance level at 10%, **Significance level at 5% and ***Significance level at 1%.

3. Interviewees in favor of improvements to peri-urban rural areas

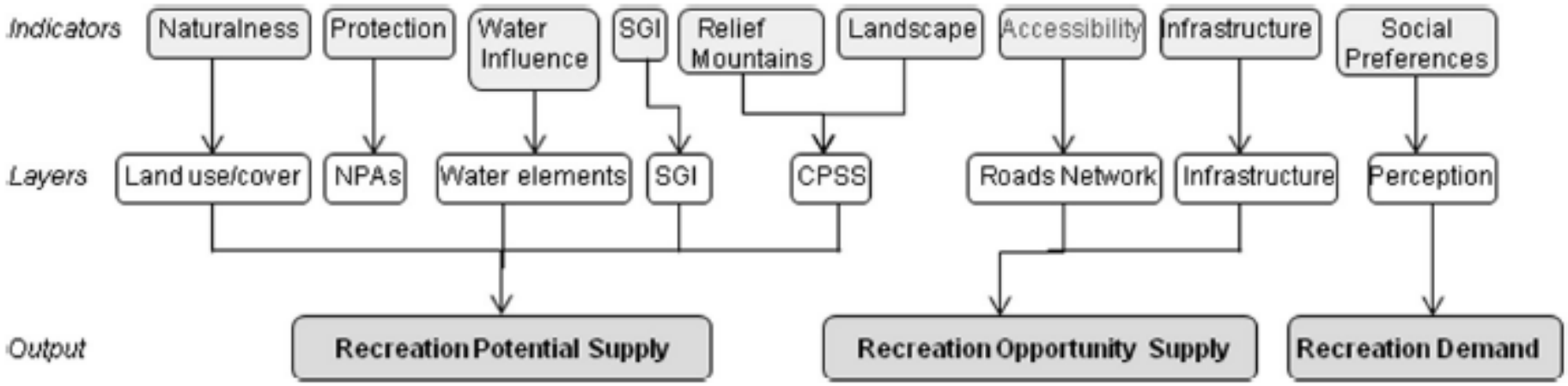
4. Authorities to High light the role of the BMG ecosystems: regulating services and historic and cultural values to improve people's awareness of the ecosystems' capacity to provide benefits to society.

Example:

Methodologies development to evaluate recreational demand



- **Recreation supply**
  - -Recreational potential
  - - Accessibility
- -**Social demand:** photo-questionnaires (629)



Peña et al. 2015. *Ecosystem Services 13:108-118*

Table 2
Mean perceived value of the environmental units (mean ± standard error) and results of Turkey's test: means with the same letter are not significantly different at $P < 0.05$. ANOVA was significant at $P \leq 0$, 0001.

Environmental units	Perceived value	Environmental units	Perceived value
Rivers	5.68 ± 0.03 a	Villages	4.37 ± 0.05 gi
Rocky areas	5.49 ± 0.03 ab	Orchards	4.36 ± 0.05 gi
Montane grasslands	5.42 ± 0.03 b	Vineyards	4.31 ± 0.05 hi
Natural forests	5.39 ± 0.04 b	Mediterranean shrubs	4.18 ± 0.05 ij
Reservoirs	5.34 ± 0.04 bc	Peatlands	4.07 ± 0.05 j
Beaches	5.14 ± 0.04 cd	Crops	3.93 ± 0.05 jk
Cliff	5.11 ± 0.04 cde	Parks	3.72 ± 0.05 kl
Water bodies	4.98 ± 0.04 df	Coniferous plantations	3.70 ± 0.06 l
Cantabrian evergreen-oak forests	4.97 ± 0.04 df	Eucalyptus plantations	2.79 ± 0.06 m
Heaths	4. 90 ± 0.04 ef	Cities	2.29 ± 0.04 n
Salt marshes	4.76 ± 0.04 fg	Abandoned quarries	2.04 ± 0.05 o
Atlantic shrubs (no heaths)	4.43 ± 0.05 g	Active quarries	1.51 ± 0.04 p
Grasslands	4.42 ± 0.05 gh		

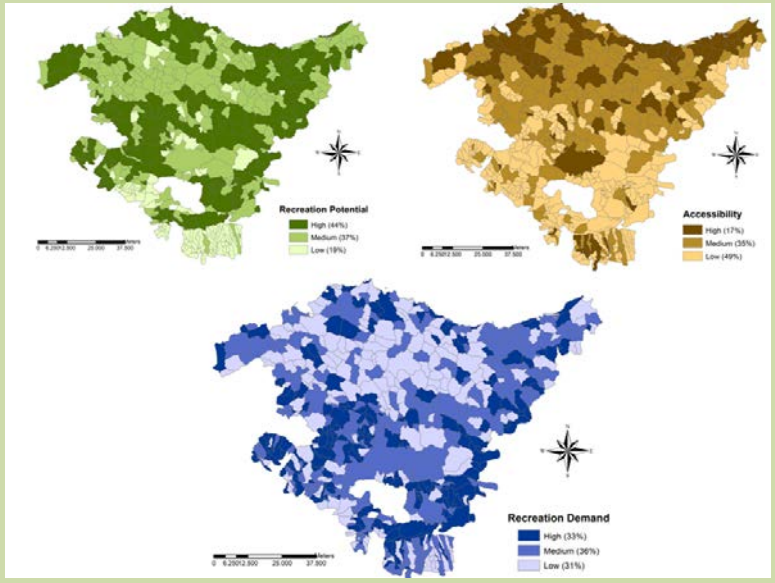
Fig. 3. Example of photos used in the photo-questionnaire.

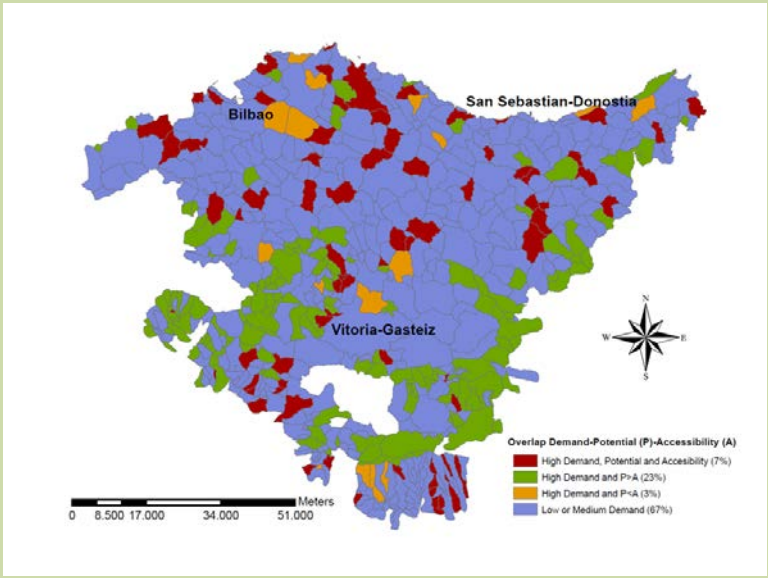
Results

1. People´s aesthetic preferences is a reasonable proxy and visual survey efficient method

2. People´s aesthetic based on land use management and degree of naturalness: trade-offs

3. Public demand: agroecosystems (low recreation potential)





Peña et al. 2015. *Ecosystem Services 13:108-118*

A multiple ecosystem services landscape index (MESLI Index)

The contribution of the rural municipalities to the provision of ecosystem services is not considered, even though they are fundamental for human well-being

Aims:

- Define an integrative environmental index of landscape multifunctionality based on the ES provided by the landscape

- Consider the provision of ecosystem services

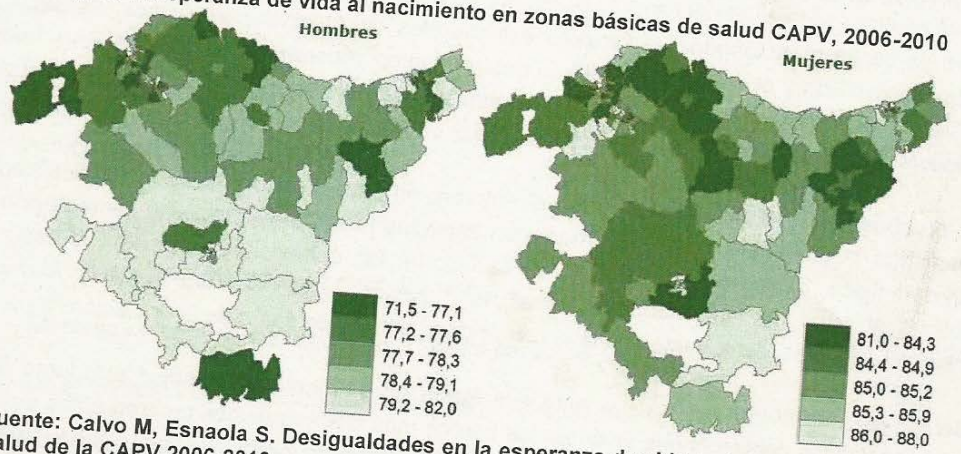
What we need for management

- The indicators to evaluate the state of the ecosystem services
- The indicators to develop a system of economic compensation or other positive social measures for the provision of ecosystem services at municipality level
- Pilot study

Rodríguez-Loinaz et al., 2014. *Journal of Environmental Mangement 147*:152-163

Life expectancy at birth in the basic health zones in the BAC 2006-10

Figura 1. Esperanza de vida al nacimiento en zonas básicas de salud CAPV, 2006-2010



Fuente: Calvo M, Esnaola S. Desigualdades en la esperanza de vida en las zonas básicas de salud de la CAPV,2006-2010

Tabla 1. Ranking de las 10 zonas básicas de salud con mayor y menor esperanza de vida CAPV 2006-2010

Hombres		
CAPV	78,1	EV I. C. del 95% (78,0 78,2)
Zona básica de salud (OSI)		
Gasteiz Sur (Araba)	82,0*	(79,4 84,6)
Montaña Alavesa (Araba)	81,9*	(79,0 84,9)
Algorta (Uribe)	81,2*	(80,1 82,3)
Lakua-Arriaga (Araba)	80,9*	(78,4 83,3)
Legazpi (Goierri-Urola)	80,8*	(79,2 82,5)
Aranbizkarra I (Araba)	80,6*	(79,4 81,8)
El Pilar (Araba)	80,3*	(78,9 81,7)
LLanada Alavesa (Araba)	80,2*	(78,6 81,9)
Alava Norte (Araba)	80,1*	(78,5 81,6)
Valles Alaveses (Araba)	79,9	(78,0 81,9)
Casco Viejo (Araba)	76,1*	(74,7 77,4)
Intxaurrondo (Donostialdea)	75,9*	(74,3 77,5)
Abetxuko (Araba)	75,7	(72,6 78,8)
La Peña-Zamakola (Bilbao-Basurto)	75,7*	(74,0 77,4)
Sestao-Markonzaga-Kueto (Barakaldo-Sestao)	75,6*	(74,6 76,6)
Ortuella (Ezkerra-Enkarterri-Cruces)	75,1*	(73,1 77,1)
Pasaia-San Pedro (Donostialdea)	75,0*	(73,3 76,7)
Casco Viejo (Bilbao-Basurto)	74,2*	(72,6 75,8)
Otxarkoaga (Bilbao-Basurto)	73,7*	(72,1 75,3)
Bilbao-La Vieja (Bilbao-Basurto)	71,5*	(69,4 73,5)
Brecha (mayor EV-menor EV)	10,5	

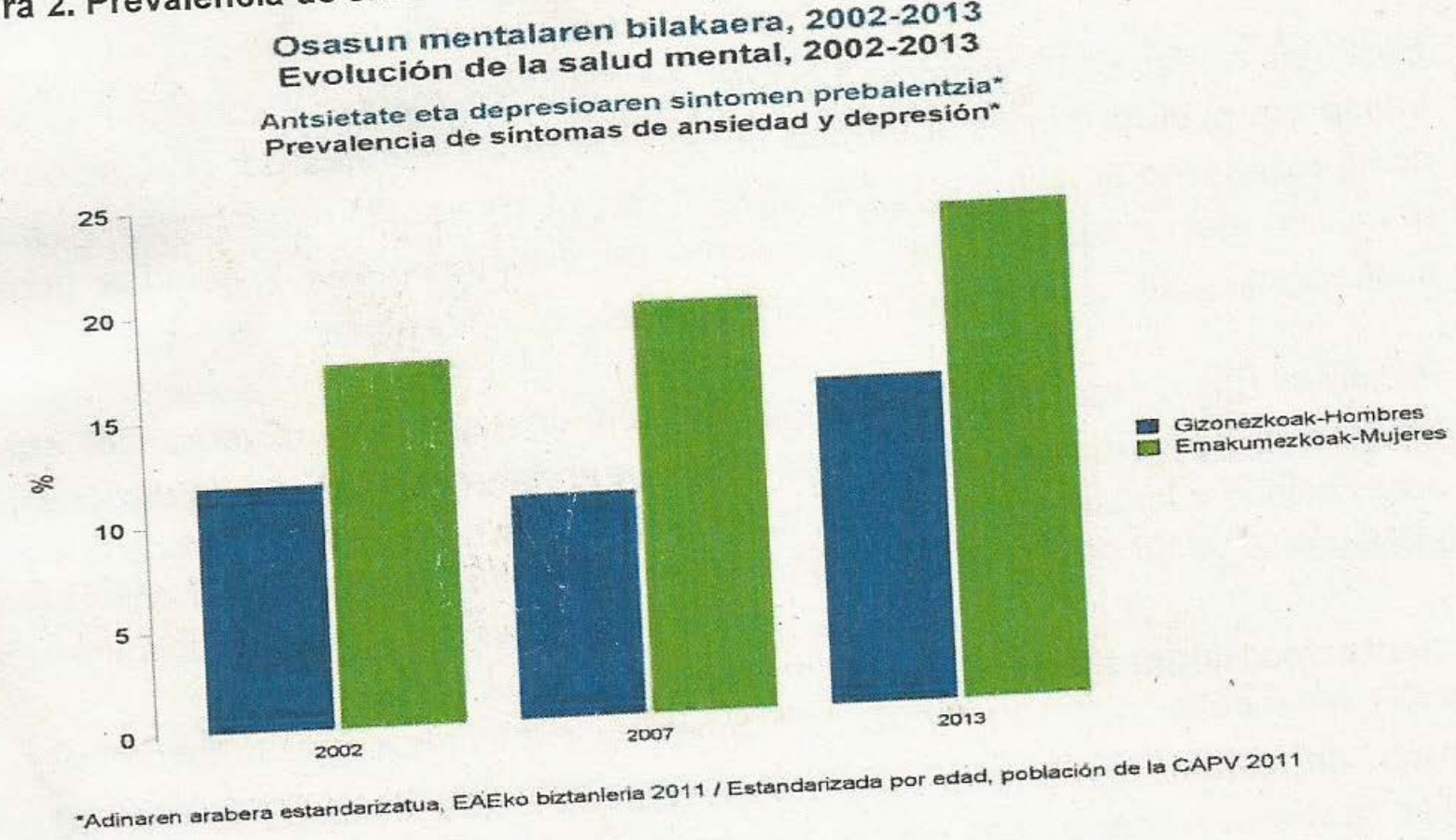
Mujeres		
CAPV	85,1	EV I. C. del 95% (85,0 85,2)
Zona básica de salud (OSI)		
Santa Lucia (Araba)	88,0*	(85,9 90,2)
Lakua-Arriaga (Araba)	87,1	(83,9 90,2)
Gasteiz-Centro (Araba)	87,0*	(86,1 88,0)
Montaña Alavesa (Araba)	86,7	(82,7 90,8)
Zorroza (Bilbao-Basurto)	86,7	(85,2 88,1)
Legazpi (Goierri-Urola)	86,6	(84,5 88,7)
Portugalete-Castaños (Ezkerra-Enkarterri-Cruces)	86,6*	(85,5 87,7)
Lakuabizkarra (Araba)	86,5	(83,6 89,5)
Gazalbide-Txagorritxu (Araba)	86,5*	(85,3 87,7)
Aranbizkarra I (Araba)	86,5*	(85,3 87,7)
Abetxuko (Araba)	83,7	(79,5 87,9)
Abanto-Muskiz (Ezkerra-Enkarterri-Cruces)	83,7*	(82,6 84,7)
Casco Viejo (Bilbao-Basurto)	83,4	(81,8 85,1)
Leioa-Centro (Uribe)	83,0*	(81,9 84,2)
Intxaurrondo (Donostialdea)	82,5*	(80,8 84,2)
Erandio-Desierto (Uribe)	82,3*	(80,8 83,7)
Aranbizkarra II (Araba)	82,1*	(80,1 84,0)
Otxarkoaga (Bilbao-Basurto)	82,1*	(80,3 83,8)
Ibarra (Tolosaldea)	81,3*	(78,9 83,7)
Bilbao-La Vieja (Bilbao-Basurto)	81,0*	(78,8 83,3)
	7,0	

* Diferencias significativas respecto de la CAPV al.C.
*: Intervalo de confianza

Fuente: Calvo M, Esnaola S. Desigualdades en la esperanza de vida en las zonas básicas de salud de la CAPV,2006-2010

Anxiety and depression symptoms

Figura 2. Prevalencia de síntomas de ansiedad y depresión



Fuente: Encuesta de Salud. Dpto. de Salud. Gobierno Vasco

Thank you very much
Eskerrik asko

Ecosystems provide goods and services that sustain all life on this planet, including human life. If damaged, we cannot fully restore them, no matter how much money we spend.

"In nature nothing exists alone."
Rachel Carson, Silent Spring (1962)

"Organisms have figure out the way of doing the amazing things they do while taking care of the place that is going to take care of their offspring"
Janine Benyus

Further information:
www.ehu.es/cdsea