



I Servizi Ecosistemici delle aree agroforestali nelle relazioni urbano rurali



D. Marino^{1,3,}, P. Gaglioppa², R. Guadagno¹, A. Marucci¹, M. Palmieri^{1,3}, D. Pellegrino¹*

¹University Consortium for Socioeconomic and Environmental Research (CURSA), Roma, Italy

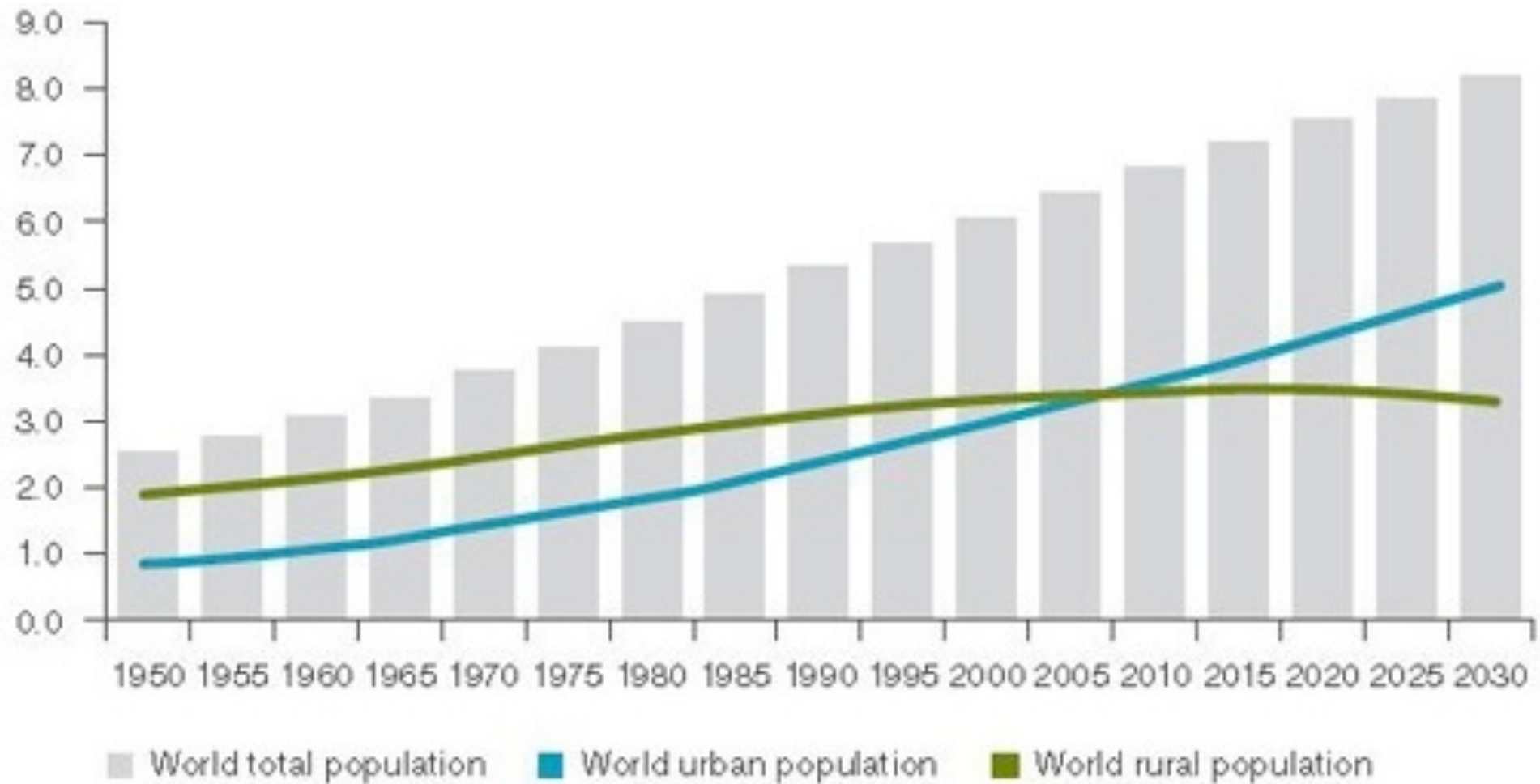
²Regione Lazio, Rome, Italy

³Department of Bioscience and Territory, University of Molise, Italy

Outline

1. Le trasformazioni in atto nei rapporti urbano - rurale
2. I servizi ecosistemici nelle aree urbane
3. Il Progetto LIFE MGN: alla ricerca della governance

1. Le trasformazioni in atto nelle aree urbane (e rurali...)



Fonte: United Nations (www.esa.un.org)

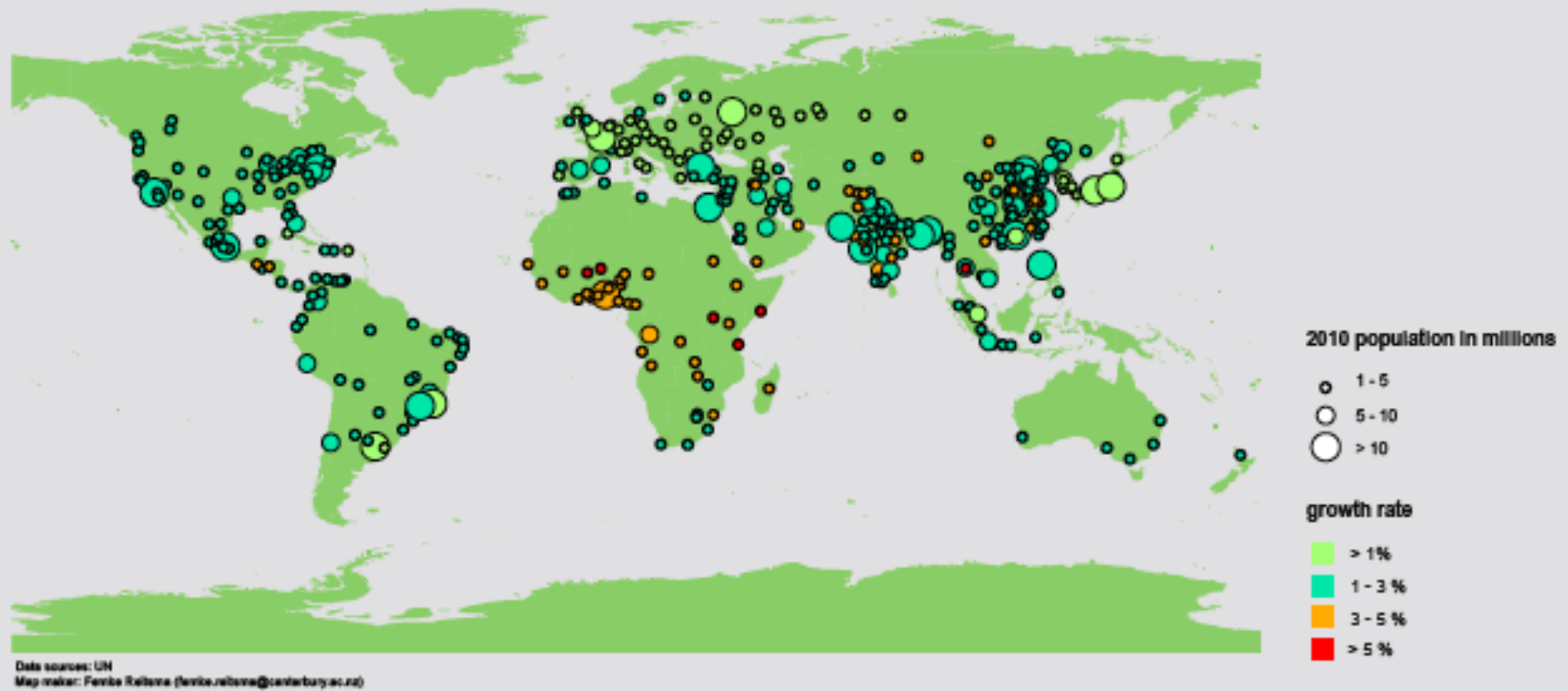
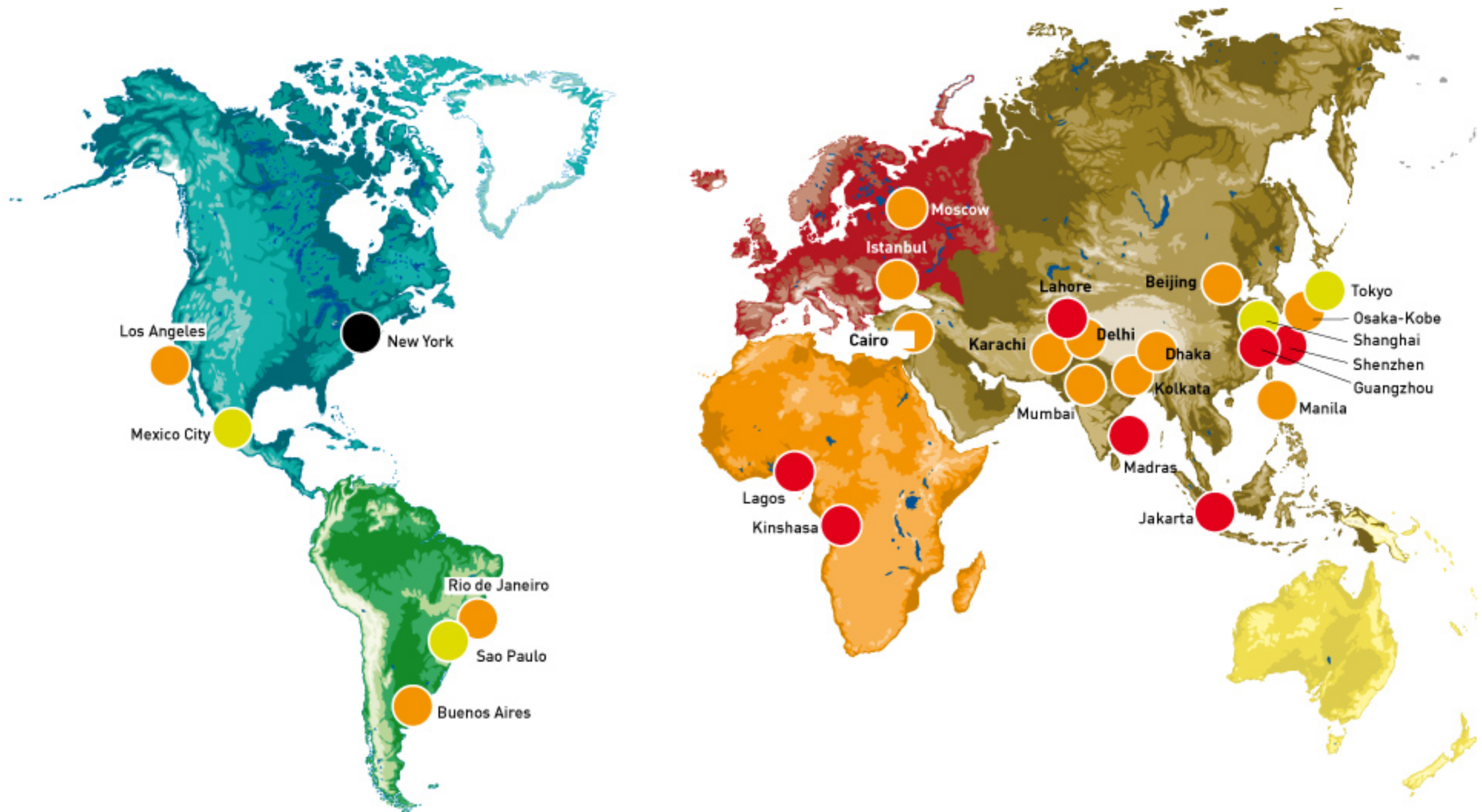


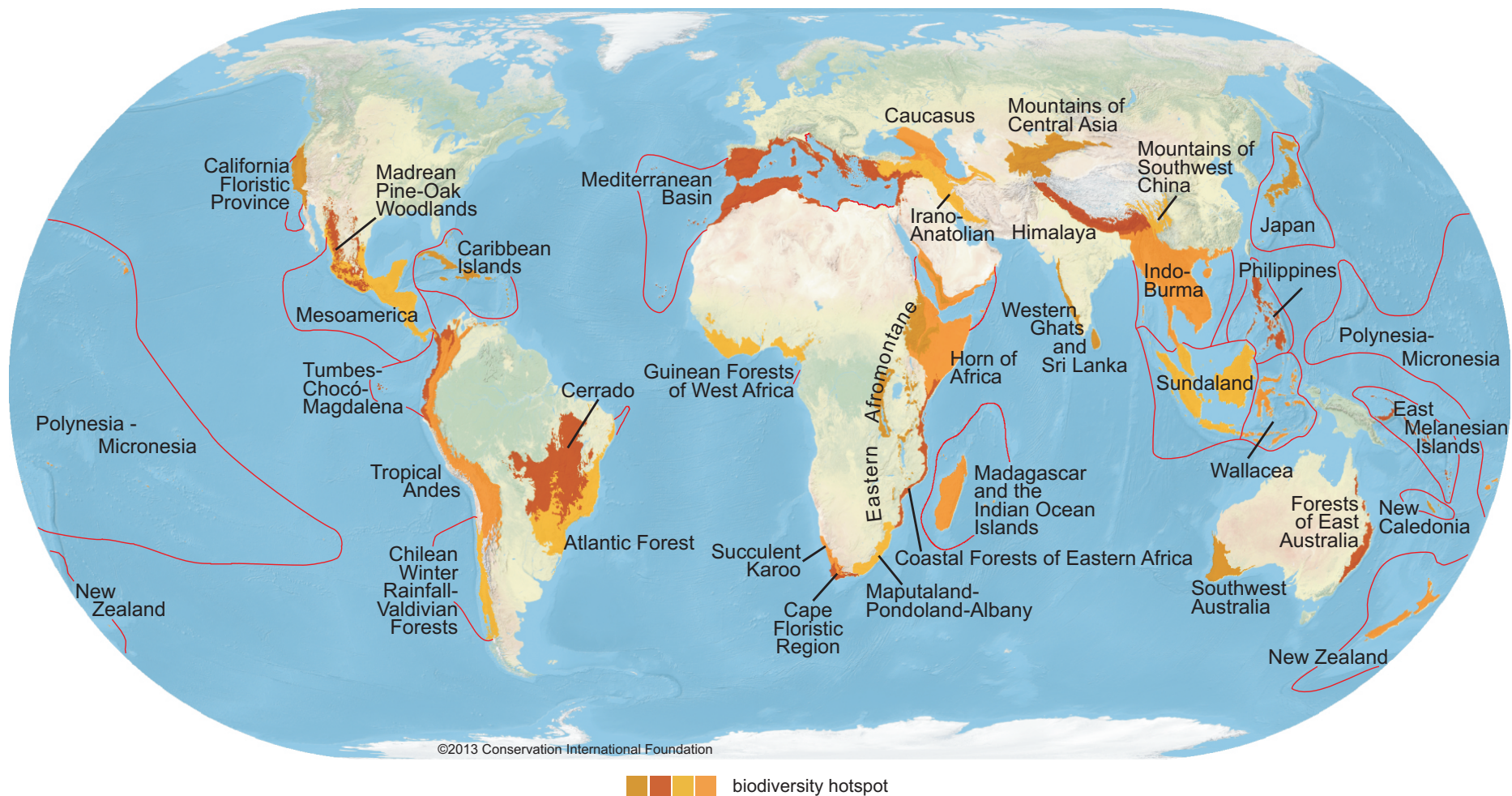
FIGURE 3. Predicted urban growth from 2010 to 2025 for cities that have a population of greater than 1 million in 2010.



Megacities (> 10 mln di abitanti)

More than ten million inhabitants since:

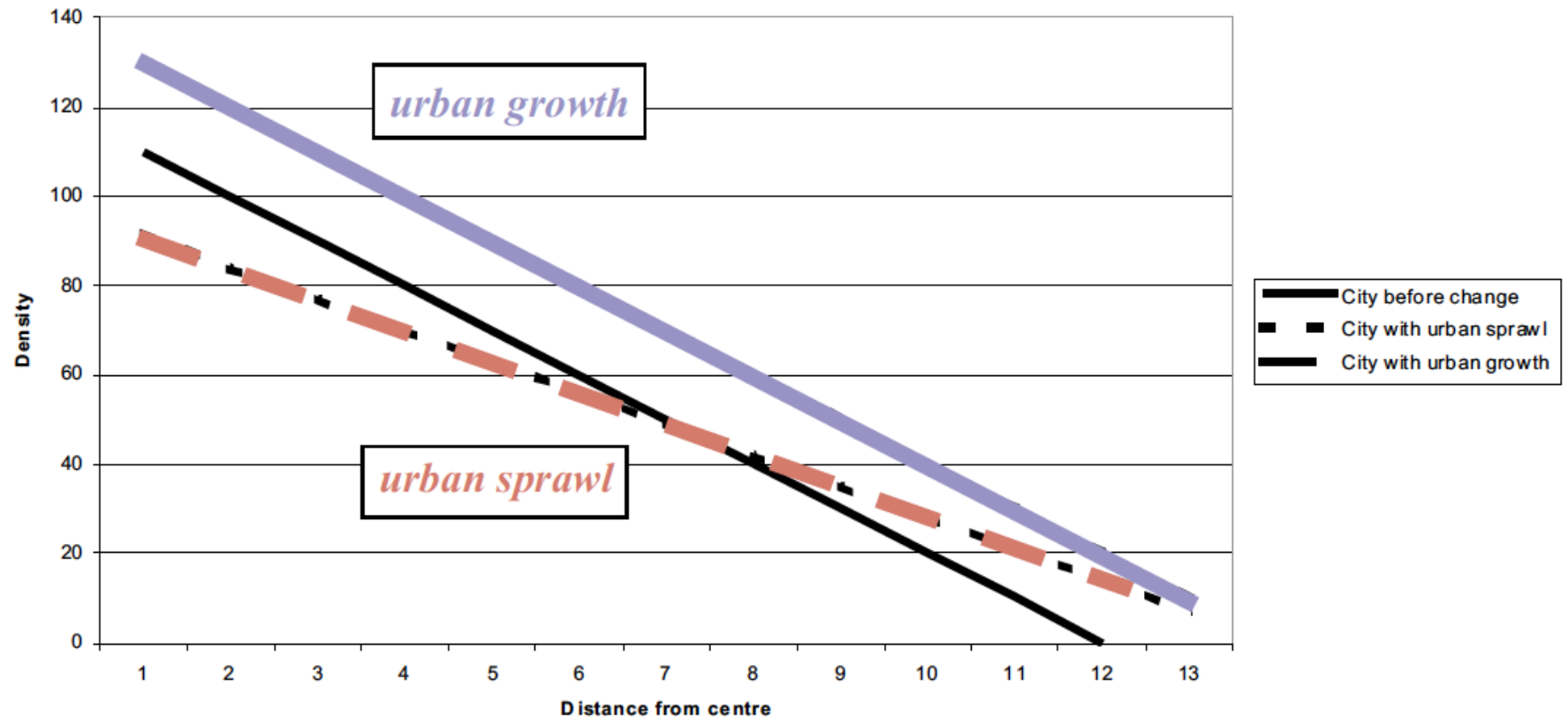




Biodiversity hotspot (BH): aree che hanno almeno 1500 specie di piante endemiche, in cui si è perso almeno il 70% degli habitat originari: I 34 BH contengono tutti aree urbane di dimensioni rilevanti per superficie e popolazione (Conservation International, 2013).

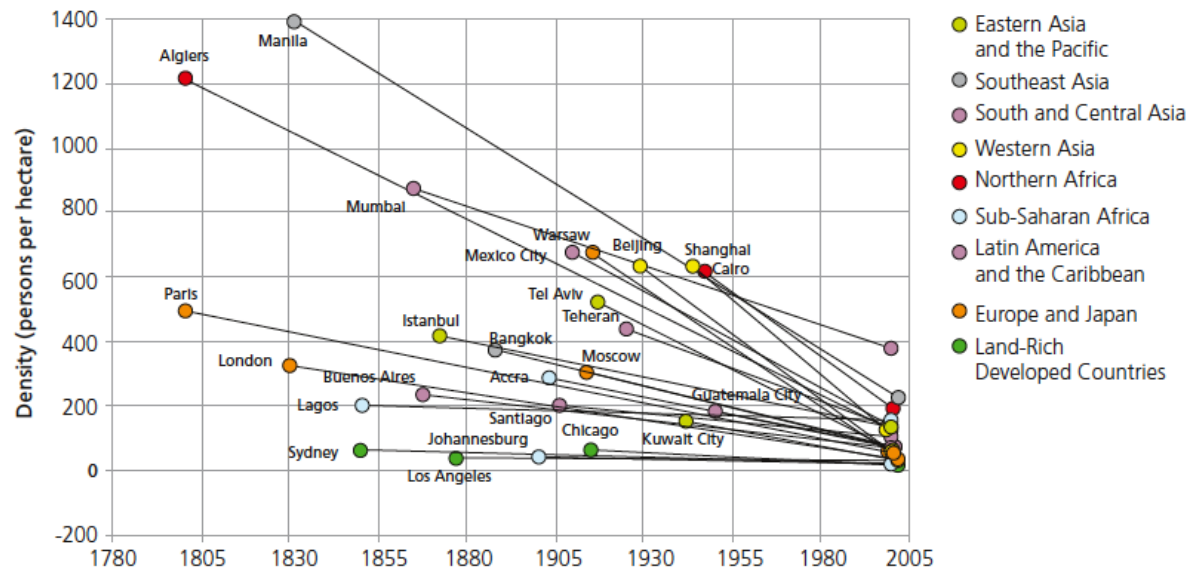
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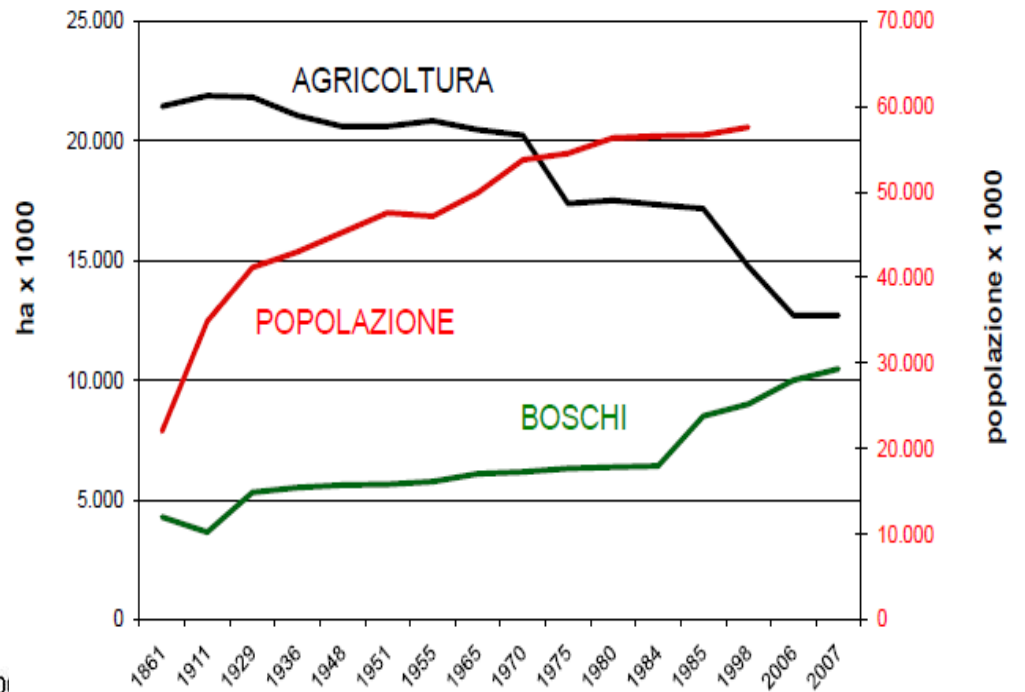
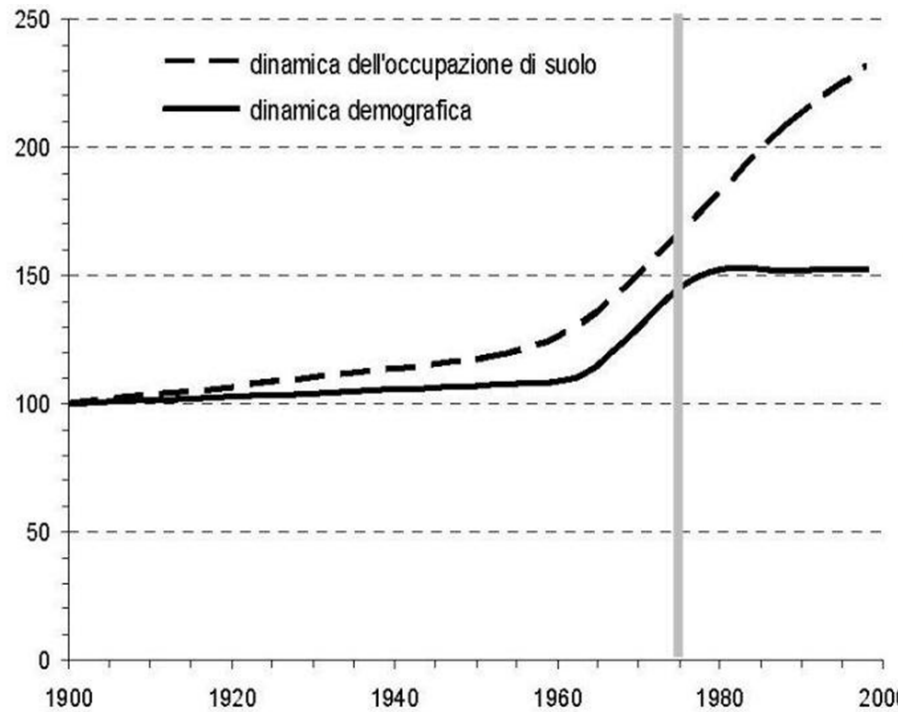
Davide Marino, Università degli Studi del Molise, network Urbano – Rurale: aspetti ambientali e socioeconomici



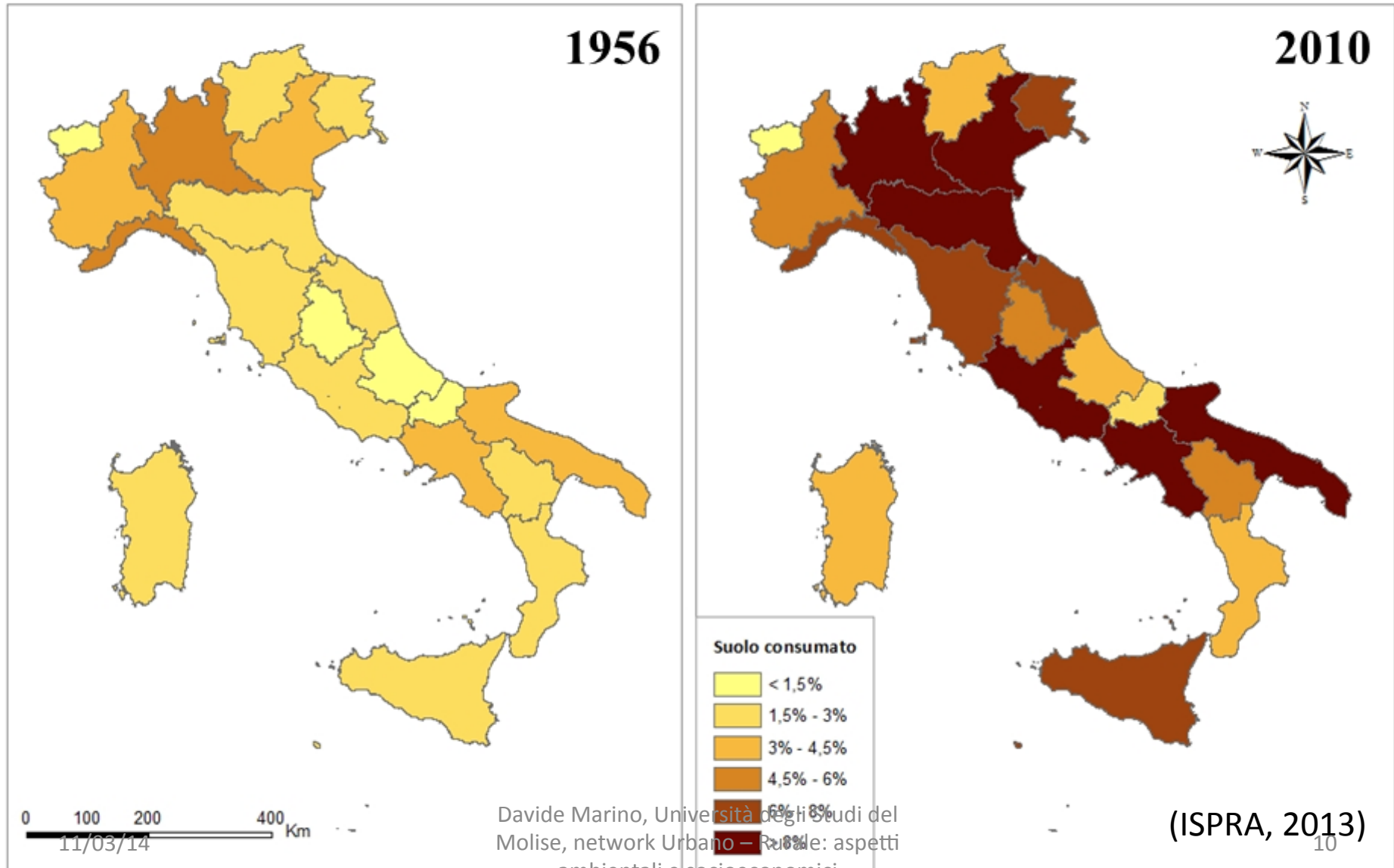
Couch et. al., 2007

Figure III: The General Decline in Built-Up Area Densities in 25 Representative Cities, 1800-2000

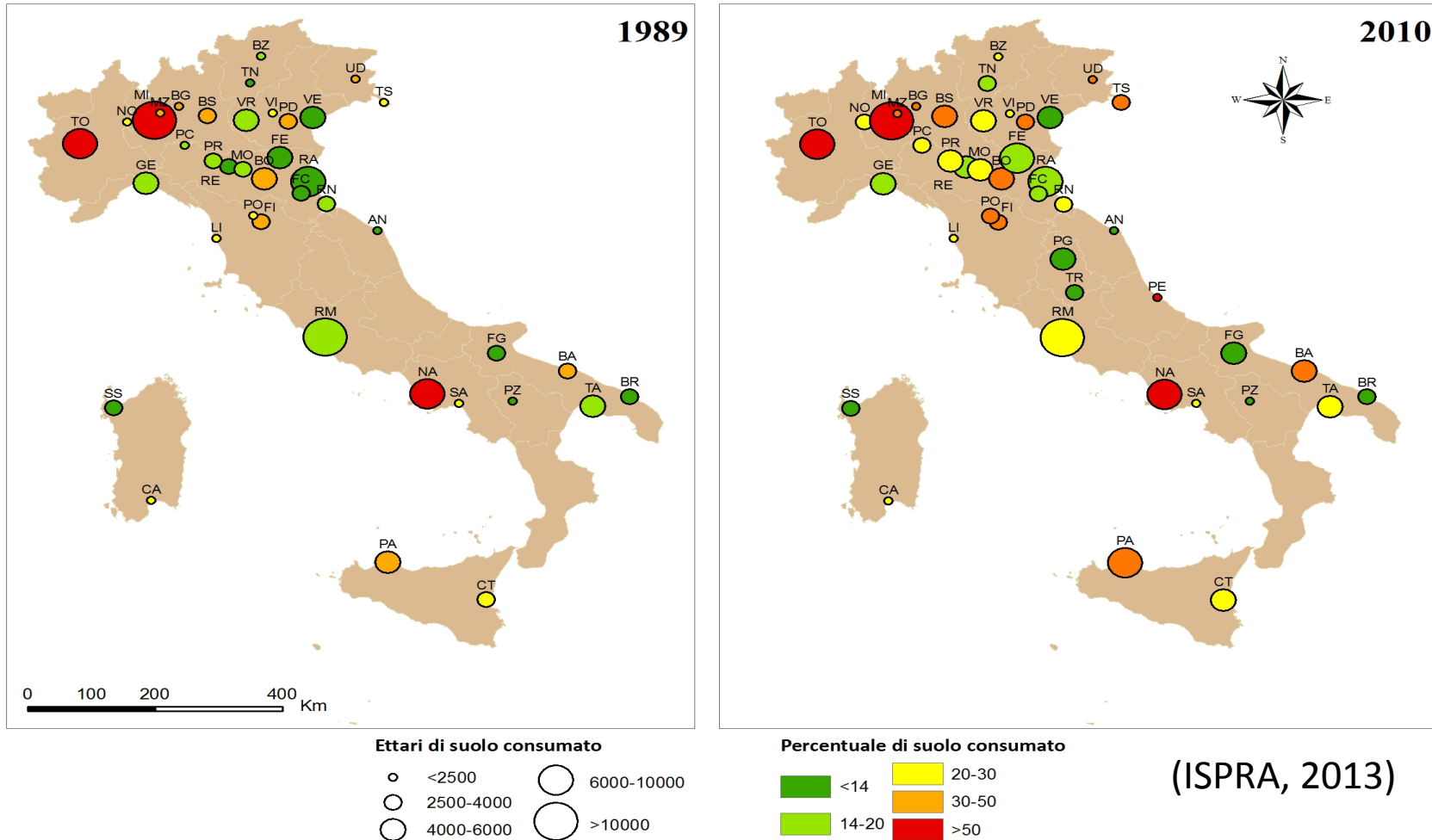


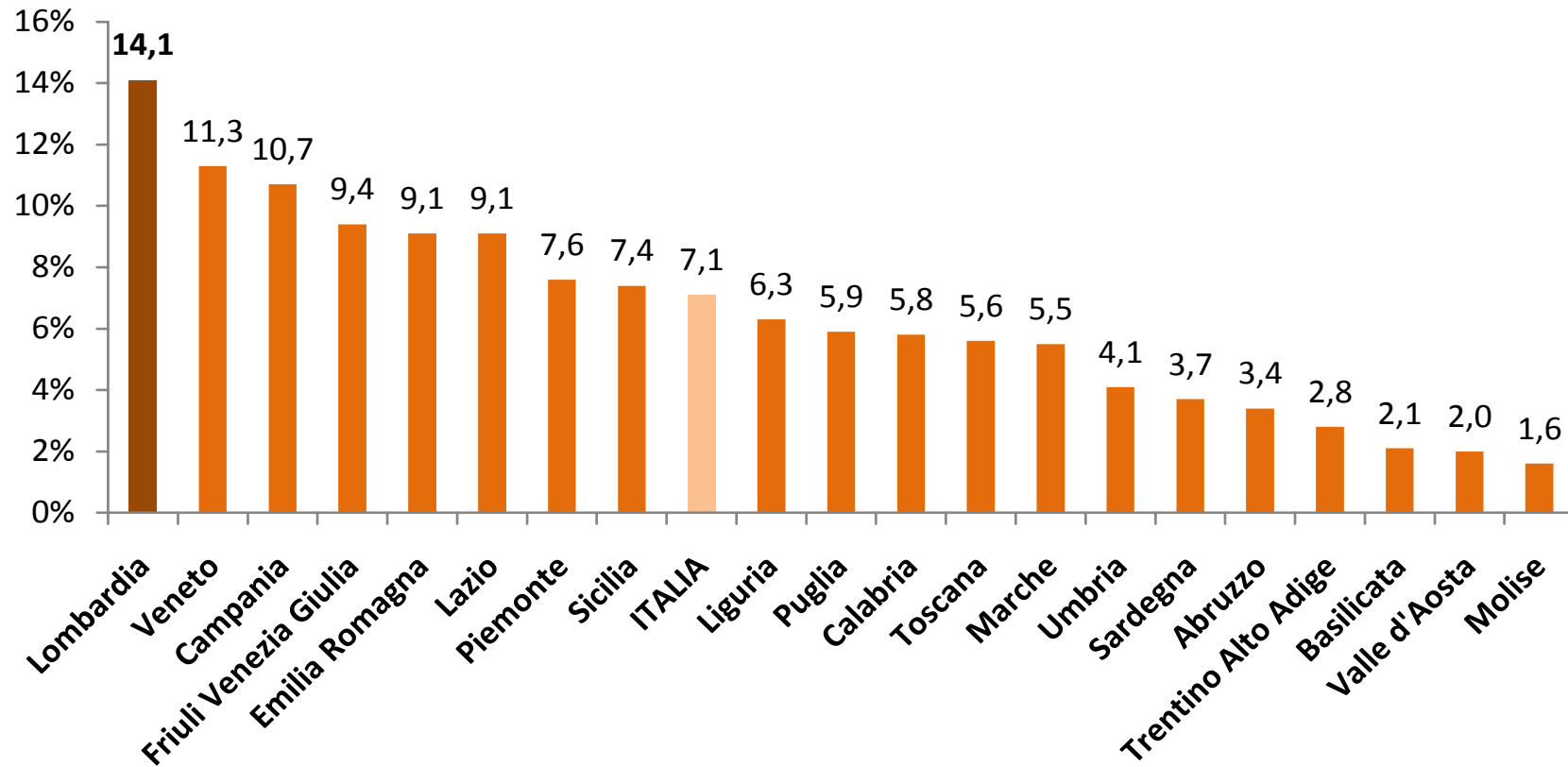


Il Consumo di suolo

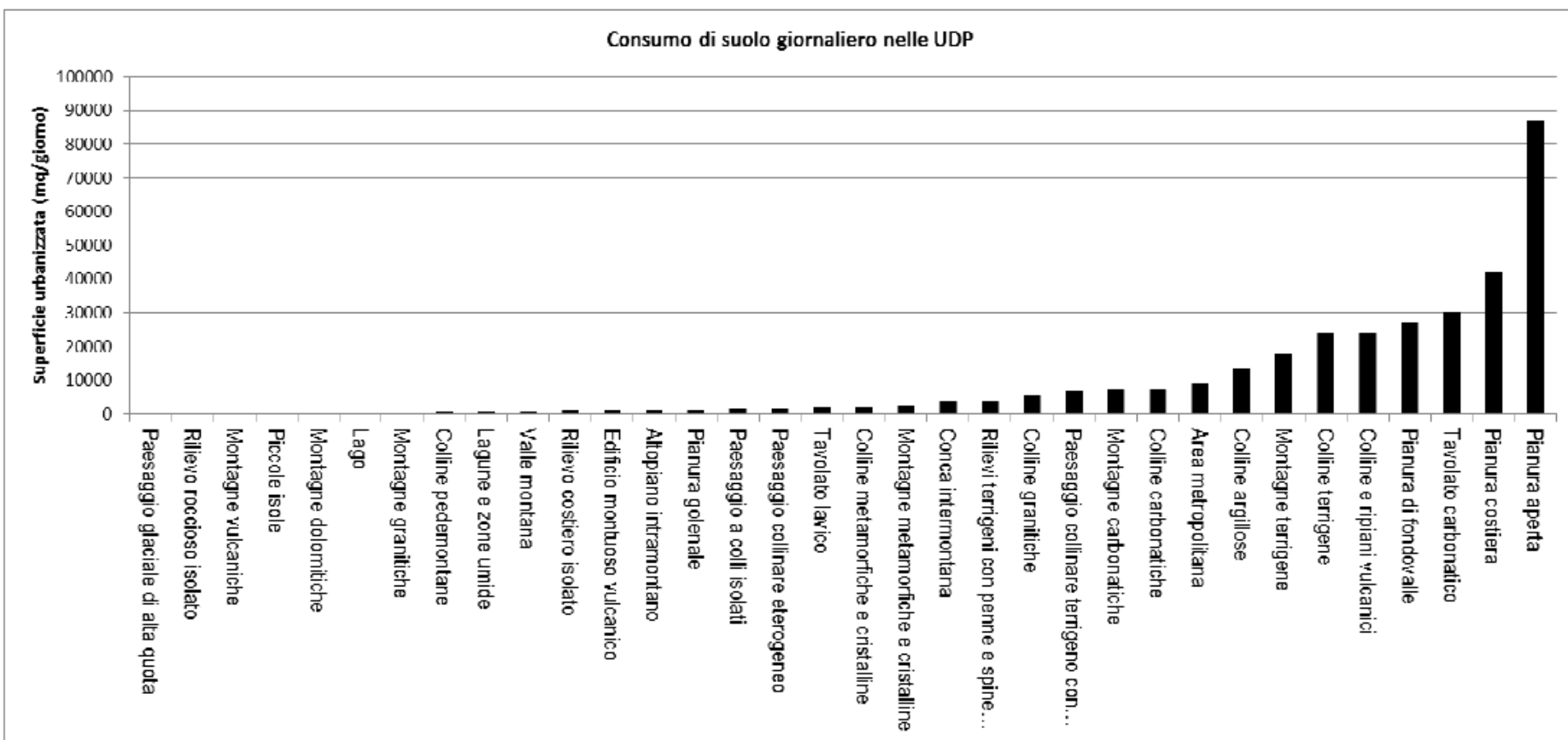


Consumo di suolo nei principali comuni italiani



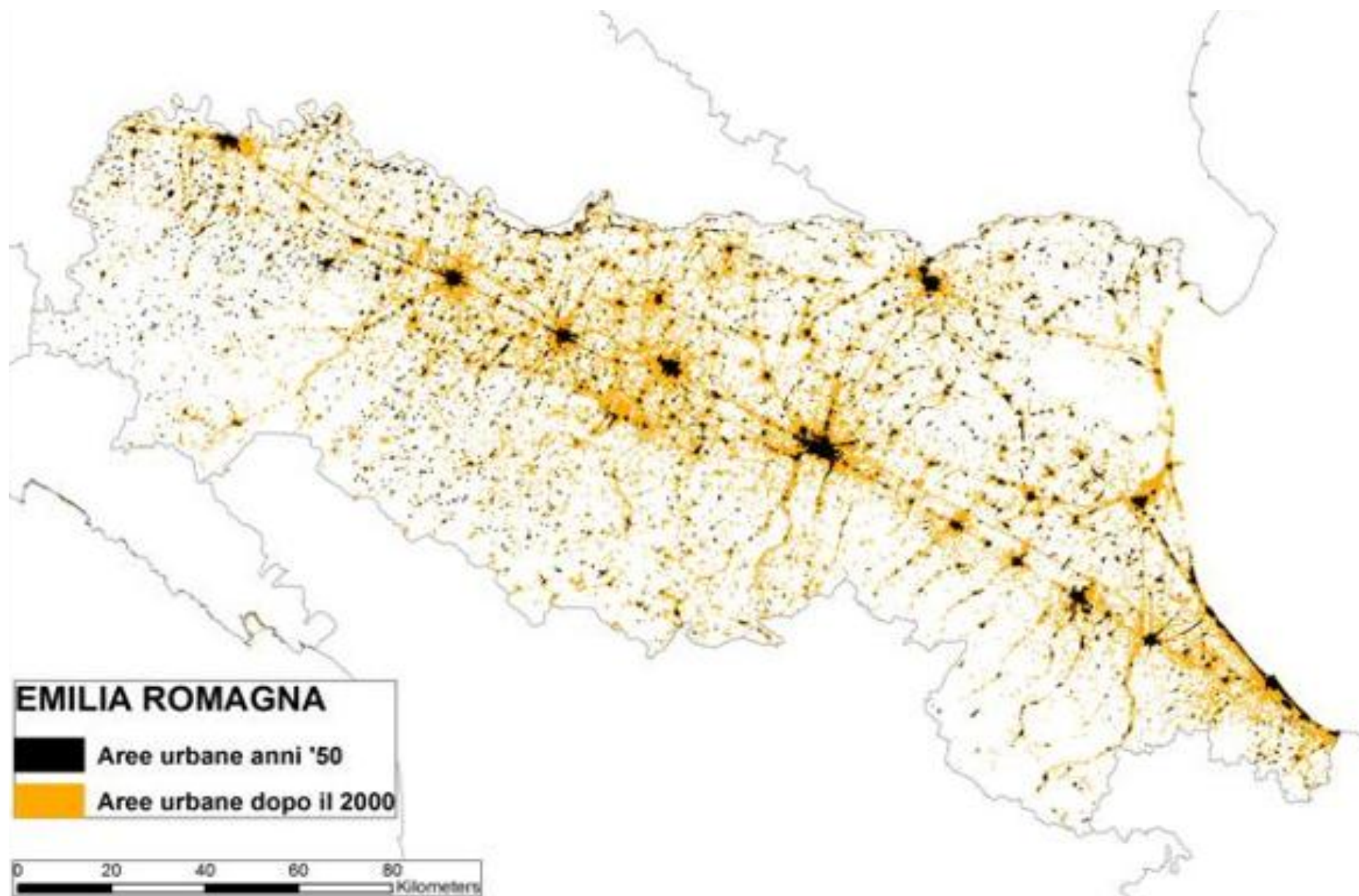


Superfici artificiali nelle regioni italiane, (Bianchi, Zanchini, 2011)



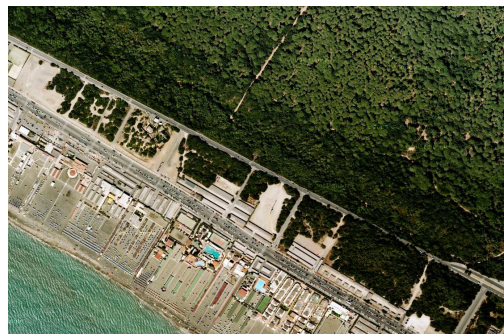
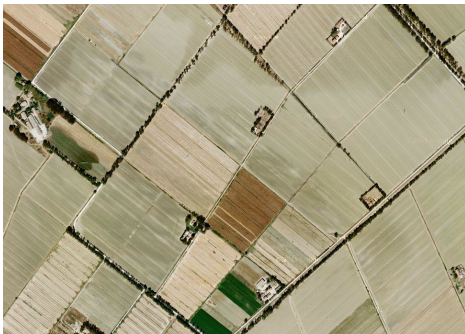
Consumo di suolo per unità di paesaggio (da Fai, WWF, 2012)

Ciome cresce la città



Il problema definitorio

- # Nel 1979 l'OECD (1979) definiva zone periurbane quelle comprese in un raggio di 20 km intorno ai nuclei urbani superiori ai 200.000 abitanti, 15 km per nuclei tra i 100.000 e i 200.000 abitanti e 10 km per centri tra i 50.000 e i 100.000 abitanti.
- # Il Censis aggrega in insiemi metropolitani tutte le unità comunali adiacenti che superano i 200 abitanti per km² e i 350.000 abitanti. Seguendo tali elaborazioni (Censis, 2008) in Italia nelle grandi aree metropolitane, che coprono il 17% della superficie territoriale, vive all'incirca il 61% della popolazione.
- # In Europa le aree classificate come periurbane occupano la stessa quantità di superficie urbanizzata delle aree urbane ma la metà della densità di popolazione. Il periurbano cresce 3,7 volte più delle aree urbane (Piorr et. al. 2009)



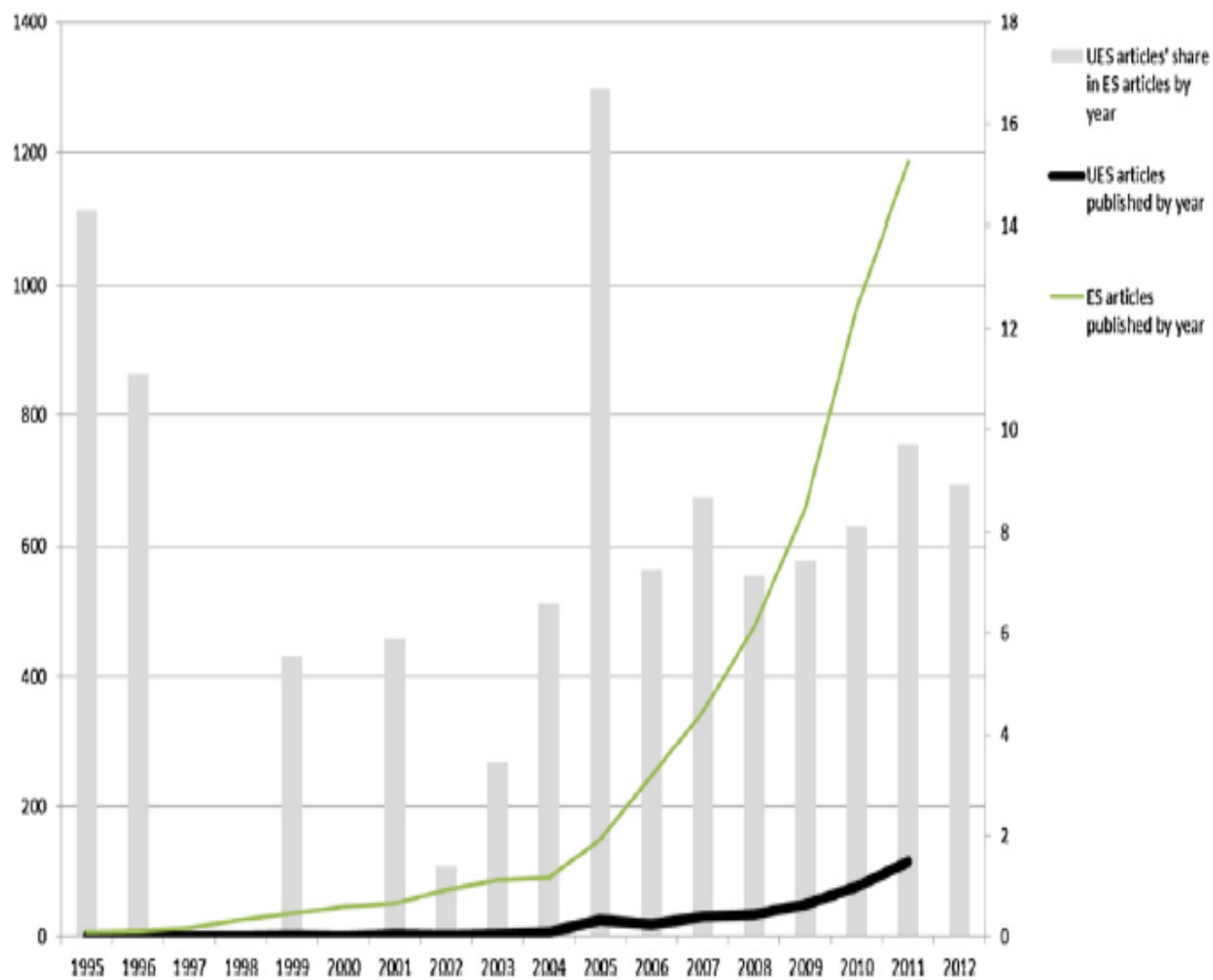



Fig. 2. Number of articles (left scale) referring to urban ecosystem services (UES) and percent share (right scale) of UES articles with respect to all of the ecosystem services (ES) articles published in a given year. *Note:* For 2012 there were 07 papers on UES and 1088 papers on ES as of October 8


The TEEB Manual for Cities: Ecosystem Services in Urban Management

Why and how can a focus on ecosystem services help cities achieve their goals? This manual guides practitioners and decision makers in a stepwise approach towards counting on a city's natural capital - and making it work for you. The concept of 'ecosystem services' is key to this.


This manual builds upon the report TEEB – The Economics of Ecosystems and biodiversity for Local and Regional Policy Makers (2010) and draws on the combined expertise in sustainability management of participating local governments in ICLEI-Local Governments for Sustainability's Local Action for Biodiversity Programme, run in partnership with the International Union for Conservation of Nature (IUCN).


Provisioning Food 


Provisioning Raw Materials 

Provisioning Fresh Water 


Provisioning Medicinal Resources 


Regulating Local Climate 


Regulating Carbon Sequestration 

Regulating Extreme Events 


Regulating Waste Water Treatment 


Regulating Soil Erosion and Fertility 


Regulating Pollination 


Regulating Biological Control 

Habitats for Species 

Habitats for Genetic Diversity 

Cultural Service: Recreation 

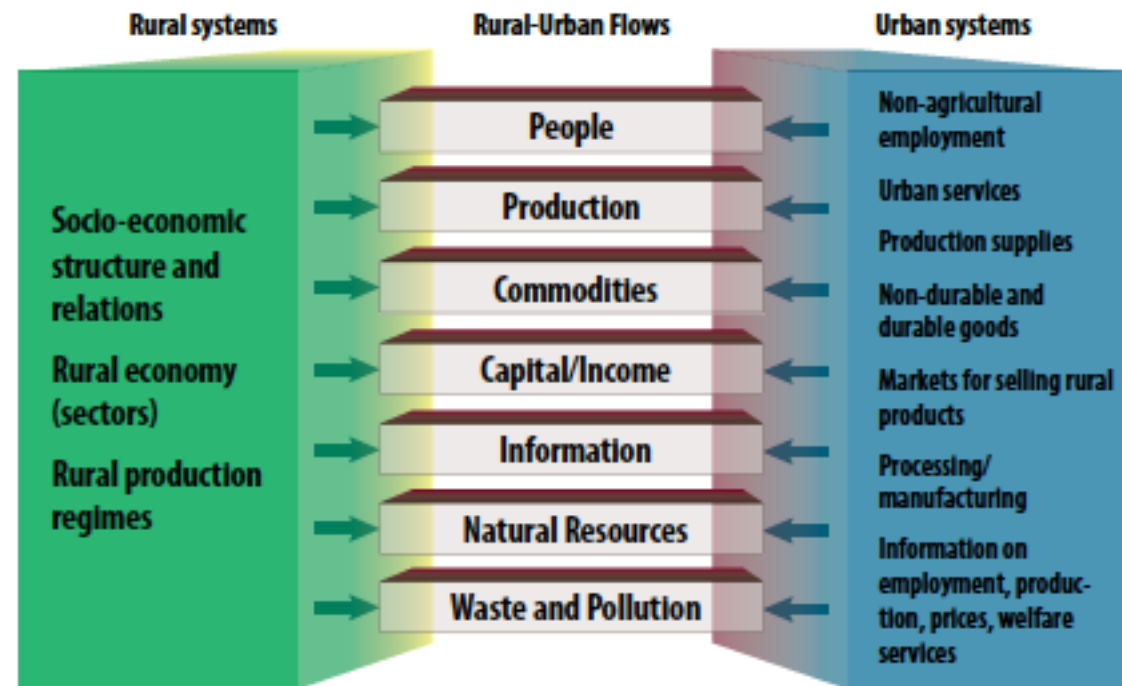
Cultural Service: Tourism 

Cultural Service: Aesthetic appreciation 

Cultural Service: Spiritual Experience 

Icons designed by Jan Sasse for TEEB, available for non-commercial purposes, for details see teebweb.org

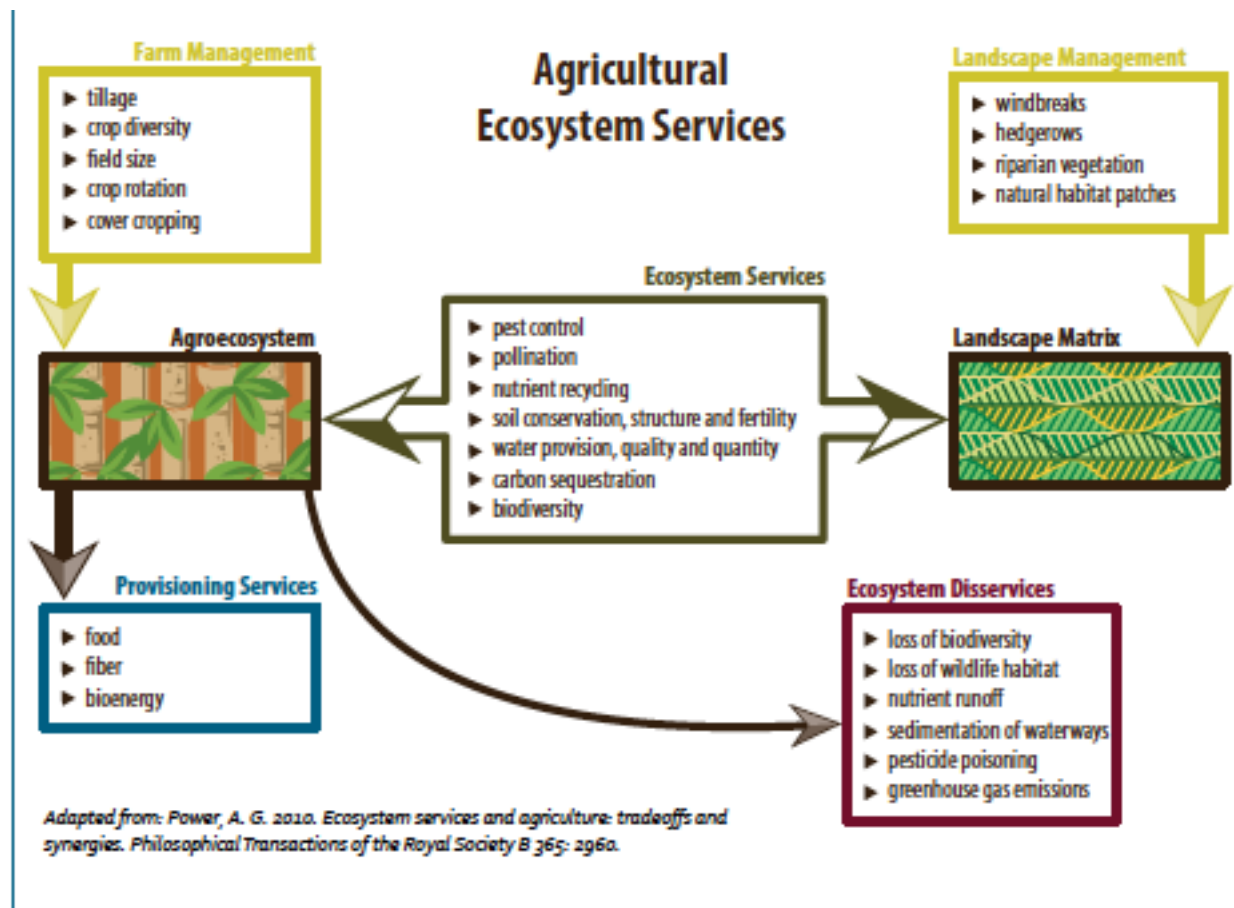
Rural-urban linkages



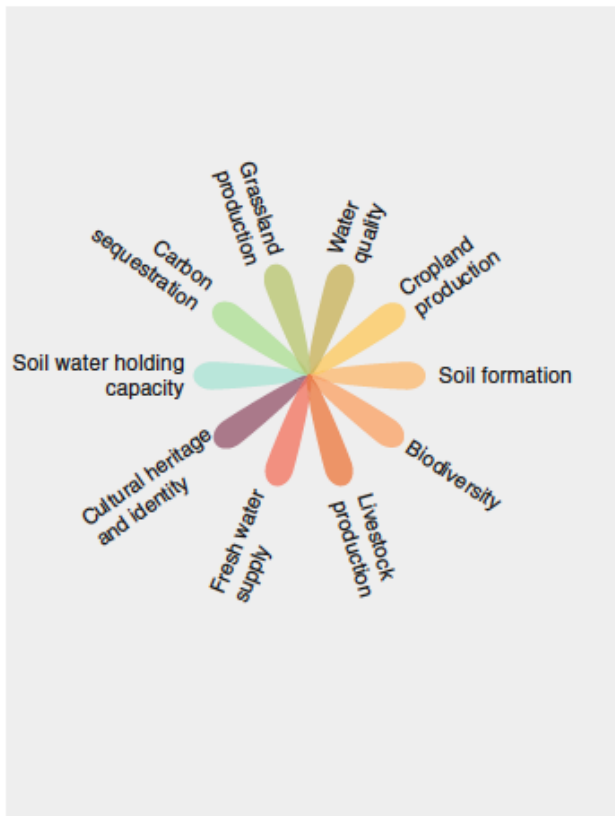
Adapted from: Allen, A. 2010. Pathways to Sustainability: Agendas for a New Politics of Environment, Development and Social Justice. Presented at: Peri-urban Dynamics, 23 - 24 September, Institute of Development Studies, Sussex, UK.

VALUABLE ECOSYSTEM SERVICES PROVIDED BY MANAGED LANDSCAPES IN URBAN AND SUBURBAN AREAS

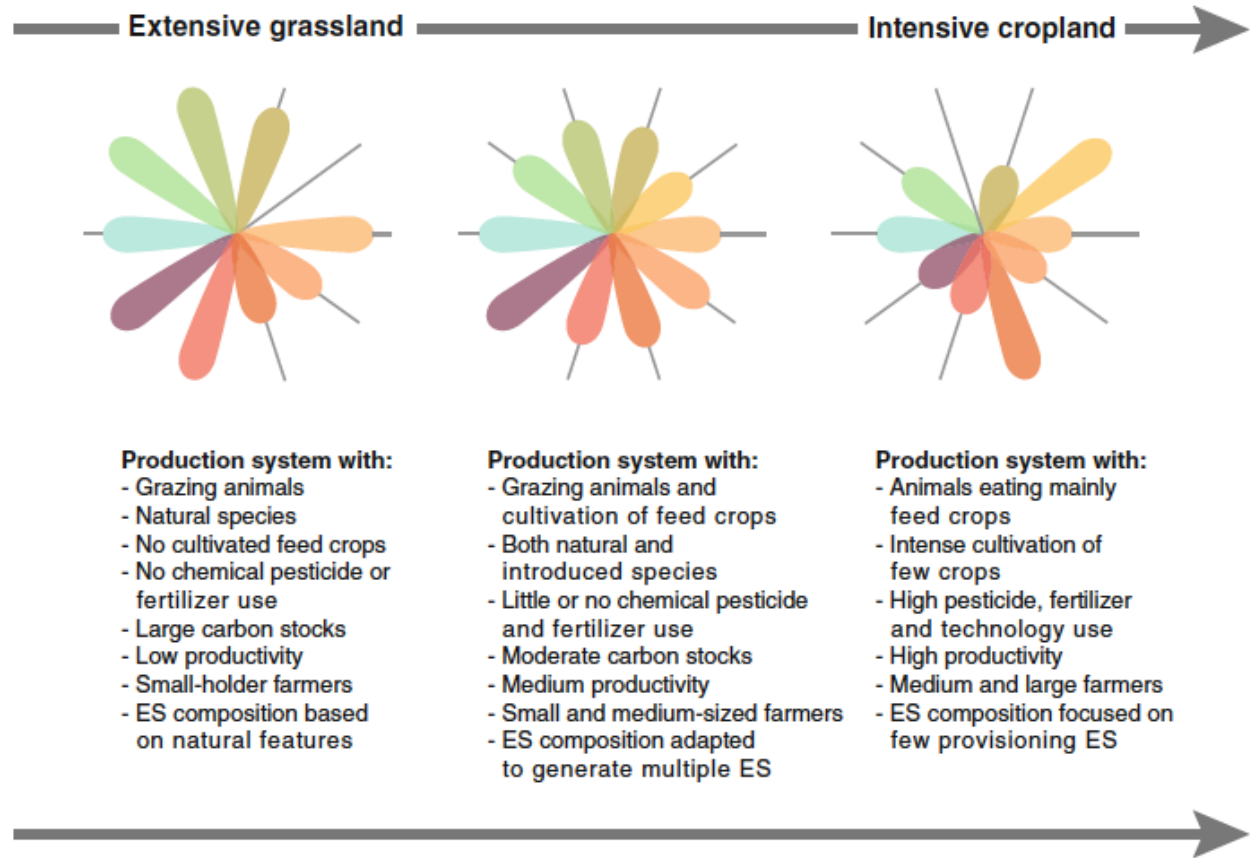
Service	Metric	Possible valuation measure	Value to landowner	Value to broader public
Aesthetic and recreation opportunities	Landscape quality rating by square footage	Added property value, measured in percentage increase of property value per additional square footage of turfgrass	x	
Water quality	Pounds of nutrients added or removed from water runoff per year	Avoided cost of implementing conventional water treatment infrastructure, measured in dollars per pound of nutrients removed		x
Air quality	Tons of particulate matter (PM) added or removed from the atmosphere per year	Added property value, measured in percentage increase of property value per household per ton of particulate matter (PM) removed from the air		x
Carbon sequestration	Tons of carbon dioxide sequestered or emitted per year	Market value of carbon, measured in dollars per ton sequestered in a carbon market		x
Local climate control	Avoided kilowatt hours of air conditioning per year	Avoided electricity cost in air conditioning or heating per year, measured in kilowatt hours	x	x
Water retention	Gallons of water runoff stored or generated per year	Avoided costs of implementing bioretention practices, measured in dollars per gallon retained	x	x
Soil retention	Tons of soil conserved or released per year	Avoided cost of replacing topsoil, measured in dollars per cubic yard	x	

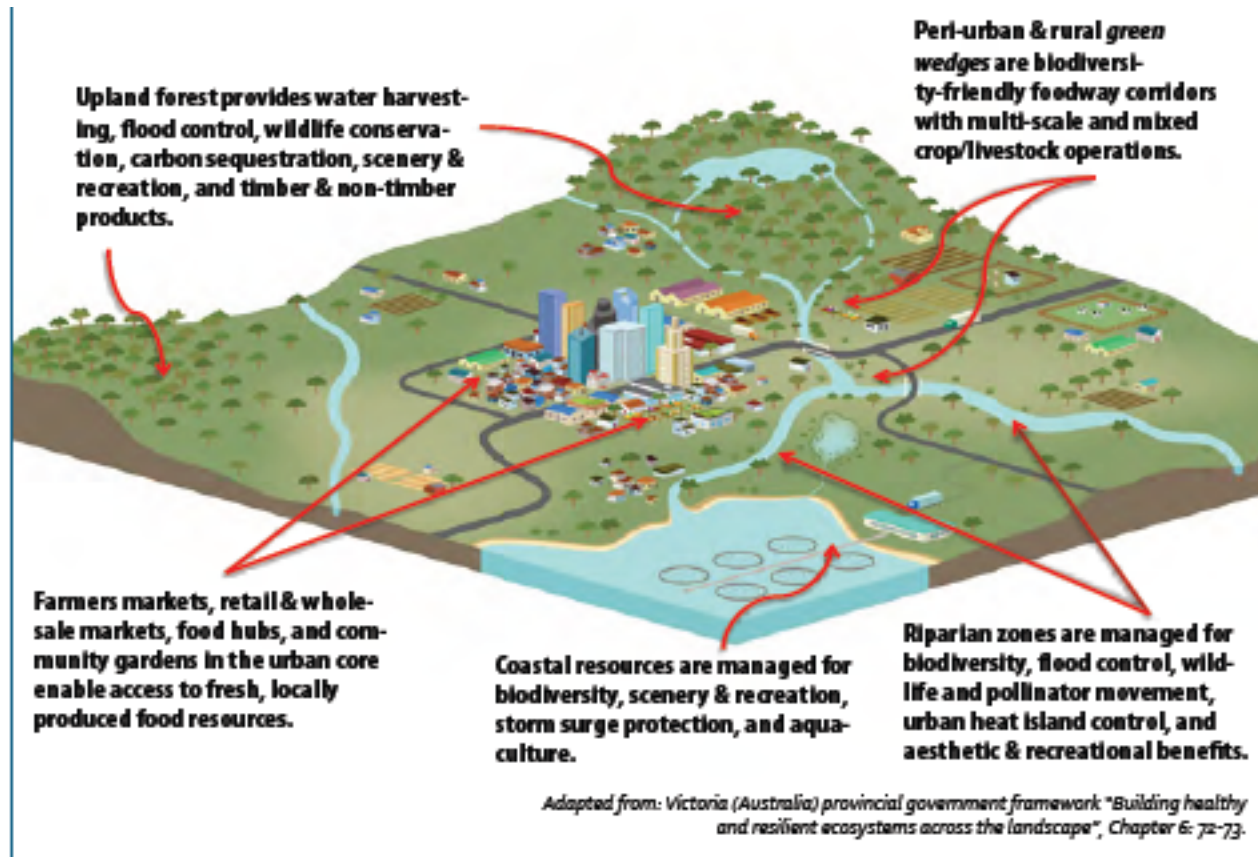


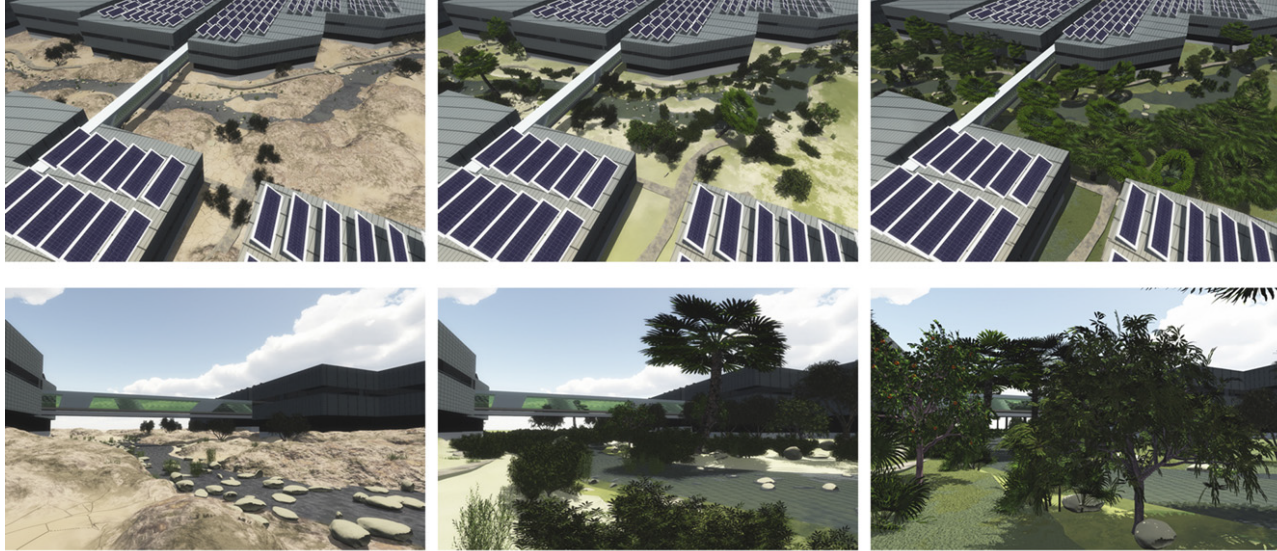
Costruire città resilienti: il ruolo dell'agricoltura nella produzione di servizi (e disservizi) ecosistemici



Fonte: Deutsch et al., 2013





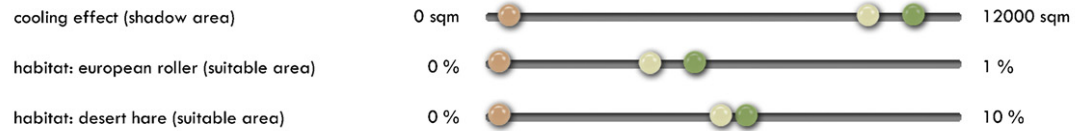


Type 1: Indigenous Style

Type 2: Mixed Style





Type 3: Mediterranean Style

Urban Ecosystem Services supply



Resource consumption



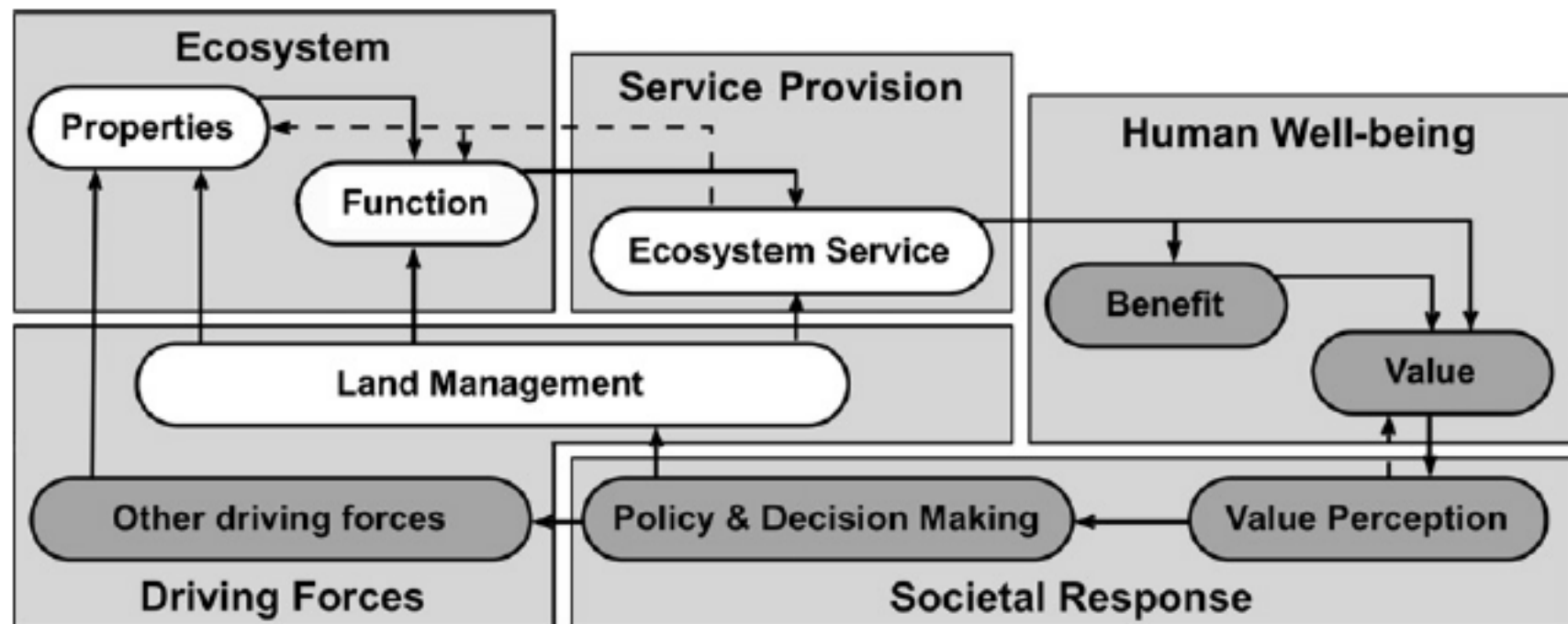
Example	Principal ecosystem services	Municipal tasks and objectives benefitting from a focus on ecosystem services
<p>Durban, South Africa: Durban examined the role of open spaces, especially in terms of meeting the basic needs (e.g. water, firewood and food) of the poor, who did not have access to adequate infrastructure or municipal services. Thanks to an assessment of ecosystem services, it was possible to demonstrate that the city's open space system significantly improved their quality of life and enhanced their ability to meet their basic needs (TEEBcase by Boon 2010).</p>	 <p>Fresh water Extreme events Tourism Food Raw materials Recreation</p>	<p>An ecosystem service approach to planning was useful to:</p> <ul style="list-style-type: none"> ● Prioritise areas for urban development. ● Make decision makers aware of the importance of nature conservation, previously perceived as a luxury. ● Motivate municipal leadership and local politicians to take a number of tough decisions to protect the environment.
<p>Miami, USA: The city has used the CITYgreen tool for systematically including 'green infrastructure' such as parks, urban forests and wetlands into urban planning. This is mainly for the purpose of storm water protection, enhancement of air- and water quality and climate regulation. As a result a riverine area was rehabilitated which subsequently generated a range of positive side effects (e.g. recreational and property values) (TEEBcase by Förster 2010).</p>	 <p>Local climate Extreme events Soil erosion and fertility</p>	<p>A focus on the benefits of green infrastructure can:</p> <ul style="list-style-type: none"> ● Support the effectiveness and efficiency of city efforts to regulate floods. ● Help the city to ensure the quality of air and water. ● Highlight the positive impact on property values.
<p>Vientiane, Lao People's Democratic Republic: Frequent heavy rainfall results in overflowing drains and urban flooding at least 6 times annually, damaging buildings and infrastructure. Several wetlands, however, absorb a proportion of the floodwater, dramatically reducing damages. The value of the ecosystem services of the wetlands has been measured (using annual value of flood damages avoided), calculating the value of the wetlands to be just under US\$5 million per year (TEEBcase by Gerrard 2010).</p>	 <p>Extreme events</p>	<p>A focus on the value of wetlands demonstrates:</p> <ul style="list-style-type: none"> ● The potential of natural retention areas for flood control. ● The savings which can be achieved by the city (e.g. less damage to infrastructure). ● The importance of incorporating an ecosystem service approach in spatial planning.
<p>Kampala, Uganda: At the outskirts of Uganda's capital the Nakivubo Swamps provide an important ecosystem service. The swamps treat and filter the biological waste water from much of the city. Ideas to drain the wetland in order to gain agricultural land were dropped when an assessment of this service showed that running a sewage treatment facility with the same capacity as the swamp would cost the city around 2 million US\$ annually (TEEBcase by Almack 2010).</p>	 <p>Waste-water treatment</p>	<p>An assessment of the value of the wetland means that:</p> <ul style="list-style-type: none"> ● City planners and the sanitation department may benefit from detailed information. ● City council can make informed decisions based on various cost estimates. ● Informal land conversion of the wetland for agriculture can be judged in the light of sewage treatment capacity lost. ● Direct investment to maintain the wetland can be identified as a cost-effective measure to ensure future purification benefits.

I Servizi Ecosistemici e il benessere umano

«[...] the benefits human populations derive, directly and indirectly, from ecosystem function» (Costanza et al., 1997)

«[...] the benefits that people obtain from ecosystems » (MA, 2005)

«[...] the direct and indirect contributions of ecosystems to human well-being» (TEEB, 2010)

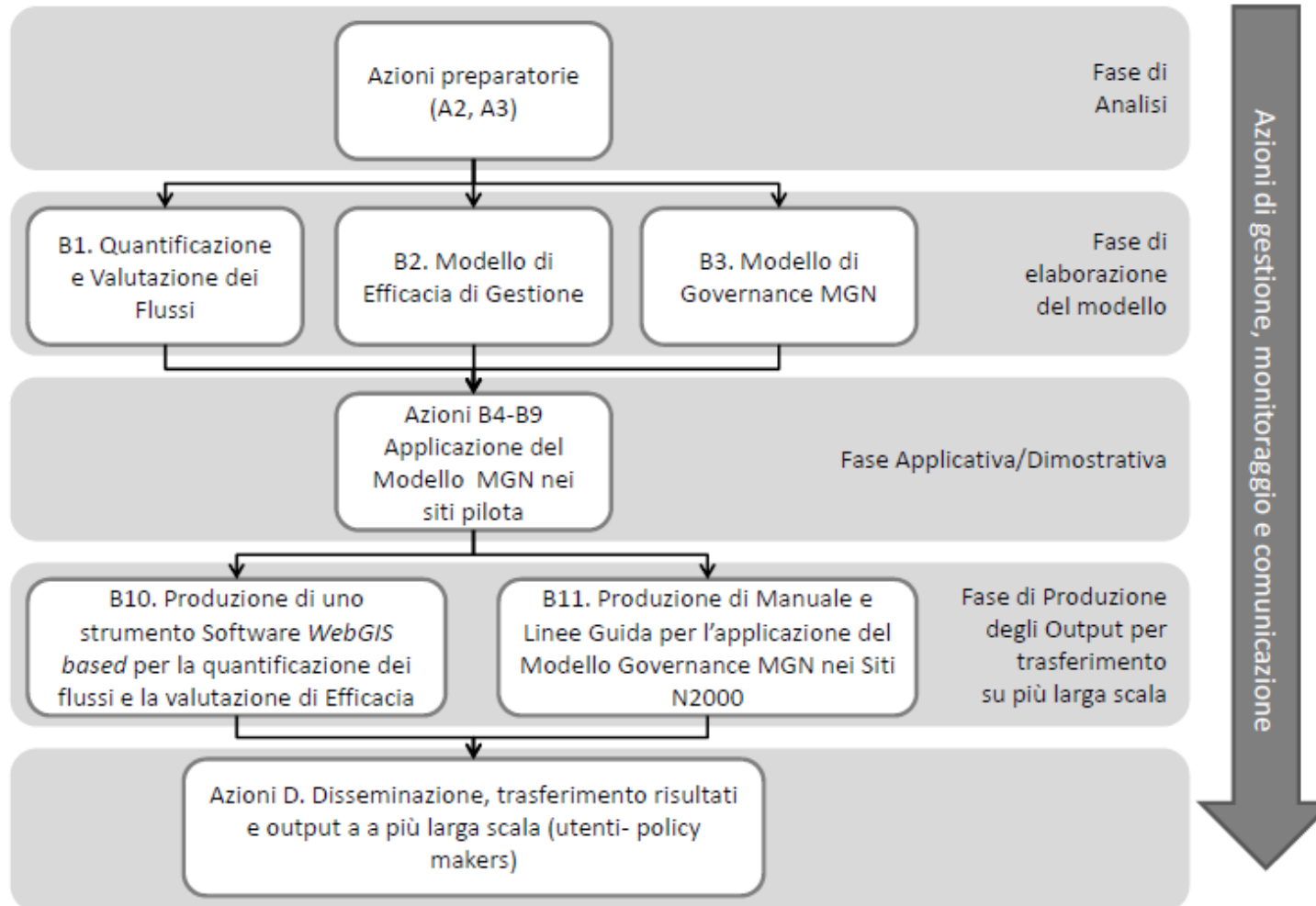


Fonte: van Oudenhoven et al, 2012

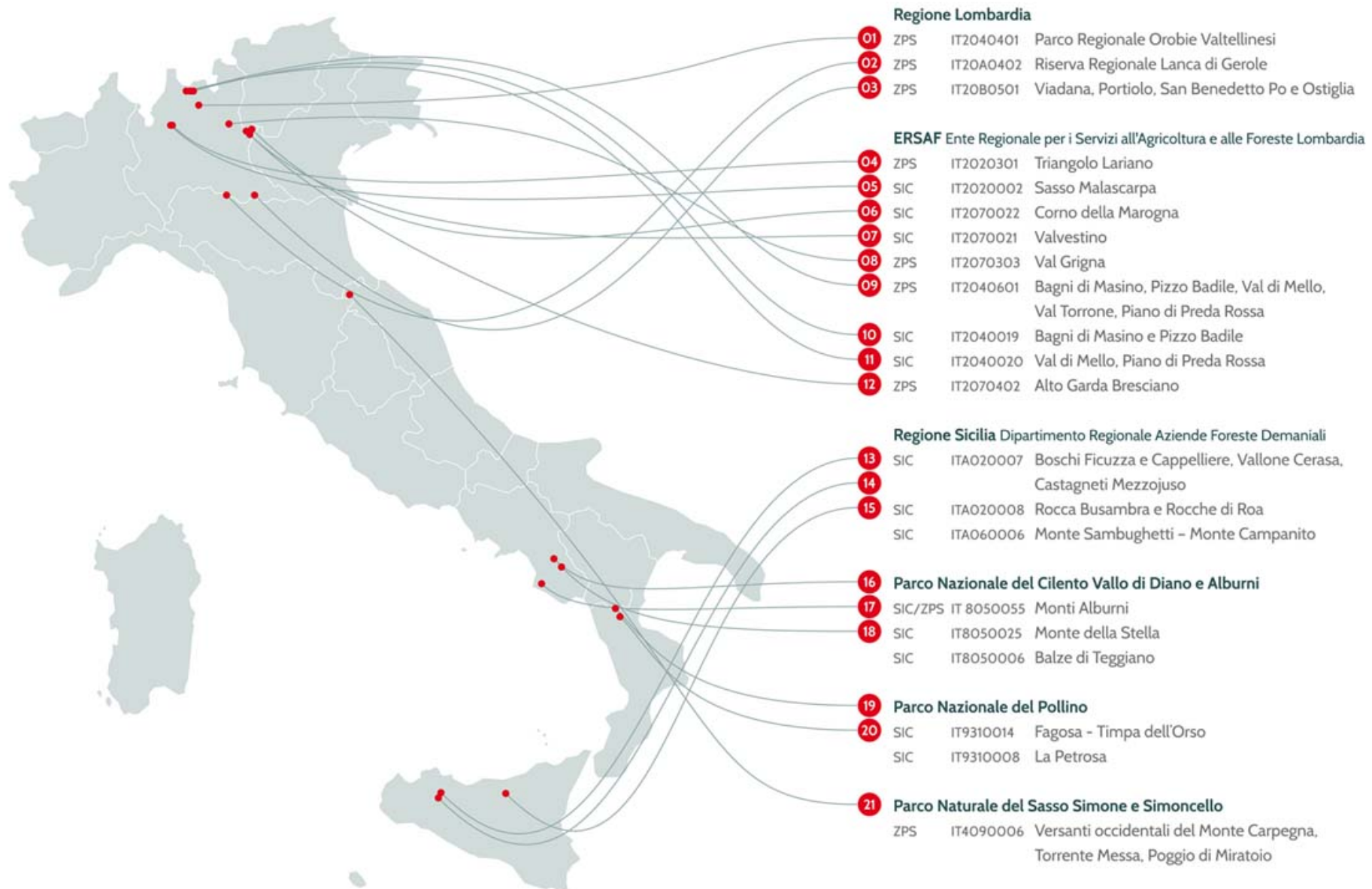
Il Progetto LIFE MGN

QUADRO GENERALE DEL PROGETTO LIFE+ :

“Making public goods provision the core business of Natura 2000”



I 21 siti pilota Natura 2000 (SIC/ZPS) coinvolti nel progetto



N.	Type	Code	Name	Region	Bioregion	Extent [km ²]
1	ZPS	IT2040401	Parco Regionale Orobie Valtellinesi	Lombardy	Alpine	228.2
2	ZPS	IT20A0402	Riserva Regionale Lanca di Gerole	Lombardy	Continental	11.8
3	ZPS	IT20B0501	Viadana, Portiolo, San Benedetto Po e Ostiglia	Lombardy	Continental	72.2
4	ZPS	IT2020301	Triangolo Lariano	Lombardy	Alpine	5.9
5	SIC	IT2020002	Sasso Malascarpa	Lombardy	Continental	3.3
6	SIC	IT2070022	Corno della Marogna	Lombardy	Alpine	35.7
7	SIC	IT2070021	Valvestino	Lombardy	Alpine	64.7
8	ZPS	IT2070303	Val Grigna	Lombardy	Alpine	28.7
9	ZPS	IT2040601	Bagni di Masino - Pizzo Badile - Val di Mello - Val Torrone - Piano di Preda Rossa	Lombardy	Alpine	96.4
10	SIC	IT2040019	Bagni di Masino - Pizzo Badile	Lombardy	Alpine	27.6
11	SIC	IT2040020	Val di Mello - Piano di Preda Rossa	Lombardy	Alpine	57.9
12	ZPS	IT2070402	Alto Garda Bresciano	Lombardy	Alpine	215.3
13	SIC	ITA020007	Boschi Ficuzza e Cappelliere, Vallone Cerasa, Castagneti Mezzojuso	Sicily	Mediterranean	41.0
14	SIC	ITA020008	Rocca Busambra e Rocche di Rao	Sicily	Mediterranean	62.4
15	SIC	ITA060006	Monte Sambughetti, Monte Campanito	Sicily	Mediterranean	31.9
16	SIC/ZPS	IT8050055	Monti Alburni	Campania	Mediterranean	253.7
17	SIC	IT8050025	Monte della Stella	Campania	Mediterranean	11.8
18	SIC	IT8050006	Balze di Teggiano	Campania	Mediterranean	12.0
19	SIC	IT9310014	Fagosa – Timpa dell'Orso	Calabria	Mediterranean	61.7
20	SIC	IT9310008	La Petrosa	Calabria	Mediterranean	3.5
21	ZPS	IT4090006	Versanti occidentali del Monte Carpegna, Torrente Messa, Poggio di Miratoio	Emilia-Romagna	Continental	21.4

Lista dei Servizi Ecosistemici usati nel progetto LIFE+MGN

<i>Servizi di approvvigionamento</i>	F1	Foraggio, pascolo
	F2	Specie cacciabili/pesci
	F3	Materie prime (legno, fibre, ecc.)
	F4	Funghi, frutti di bosco, piante commestibili
	F5	Piante medicinali
	F6	Risorse genetiche
	F7	Acqua potabile
<i>Servizi di regolazione</i>	R1	Sequestro del carbonio
	R2	Regolazione del clima
	R3	Regolazione delle acque
	R4	Purificazione dell'acqua
	R5	Protezione dall'erosione e dissesti geologici
	R6	Protezione dai dissesti idrologici
	R7	Impollinazione
	R8	Controllo biologico
	R9	Habitat per la biodiversità
<i>Servizi culturali</i>	C1	Valore estetico
	C2	Valore ricreativo (ecoturismo, attività all'aperto)
	C3	Ispirazione per cultura, arti, valori educativi e spirituali, senso d'identità

Definita a partire da: TEEB; IEEP; CICES; WRI; OECD; Bastian, 2013

Selezione dei principali SE per sito pilota

SERVIZIO ECOSISTEMICO	CODICE	ZFS IT2040401 PR Orobie V	ZFS IT20A0402 Lanca di Gerole	ZFS IT20B0501 Viadana	SIC IT2020002 Sasso Malascarpa	ZFS IT2020301 Triangolo Lariano	ZFS IT2070303 Val Grigna	SIC IT2070021 Valvestino	SIC IT2070022 Corno della Manogna	ZFS IT2070402 Allo Gandia BS	ZFS IT2040601 Bagni Masino, Val di Mello	SIC IT2040019 Bagni Masino	SIC IT2040020 Val di Mello	SIC ITA020007 Ficuzza	SIC ITA020008 Busambra	SIC ITA060006 Sambunghefi	SIC IT9310014 Fagosa	SIC IT9310008 Petrosa	SIC/ZFS IT8050055 Monti Alburni	SIC IT8050025 Monte Stella	SIC IT8050006 Balze di Teggiano	ZFS IT4090006 Monte Carpegna	TOTALE	
		Regione Lombardia	ERSAF							Regione Siciliana			PNP	PNCVDA		PNSSS								
Foraggio, pascolo	F1	■			■		■								■			■						5
specie cacciabili/pesci	F2																				■			1
Materie prime (legno, fibre,...)	F3			■				■								■								3
Funghi, frutti di bosco, PLN	F4															■				■		■		3
Piante medicinali	F5																							
Risorse genetiche	F6							■									■				■			2
Acqua potabile	F7							■						■	■			■			■		■	6
Sequestro del carbonio	R1	■			■	■	■			■	■	■	■						■					9
Regolazione clima/purificazione aria	R2																							
Regolazione delle acque	R3	■					■				■	■	■											5
Purificazione dell'acqua	R4		■	■																				2
Protezione dall'erosione e dissesti geologici	R5																		■					1
Protezione dai dissesti idrologici (piene, inondazioni)	R6																		■					1
Impollinazione	R7																							
Controllo biologico (insetti nocivi)	R8																							
Habitat per la biodiversità	R9		■																					1
Valore estetico	C1					■																		1
Valore ricreativo	C2		■	■	■	■		■	■	■	■	■	■	■			■				■			13
Ispirazione per cultura, arti	C3																	■						1

Relazioni tra SE e benessere umano

ZPS IT2070402

Alto Garda Bresciano

Habitat prevalenti:

Foreste illiriche di *Fagus sylvatica* (91k0), Foreste di versanti, ghiaioni e valloni di *Tilio-Acerion* (9180) e Foreste di *Quercus ilex* e *Quercus rotundifolia* (9340)

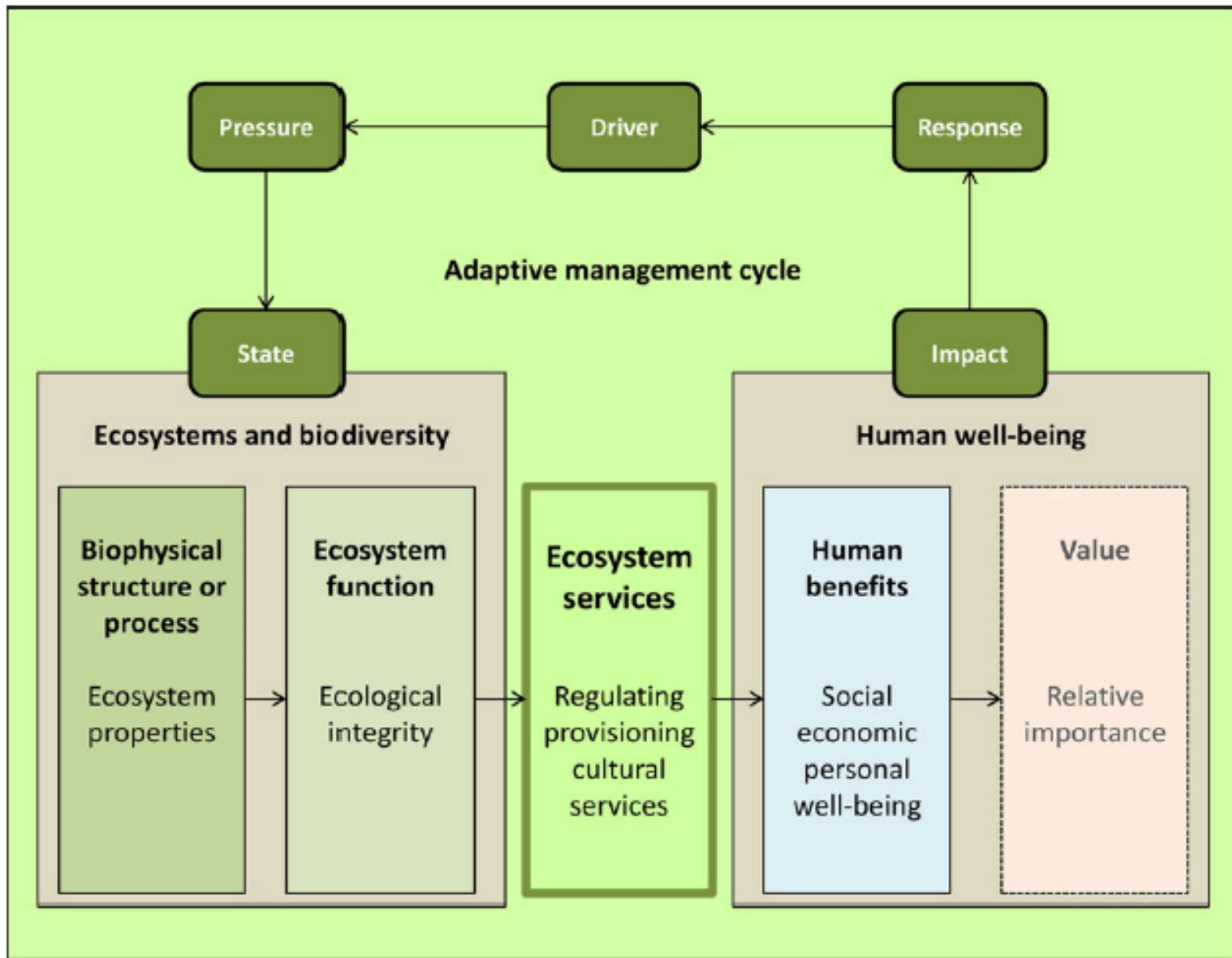
Servizio Ecosistemico esaminato:

Valore ricreativo (C2)

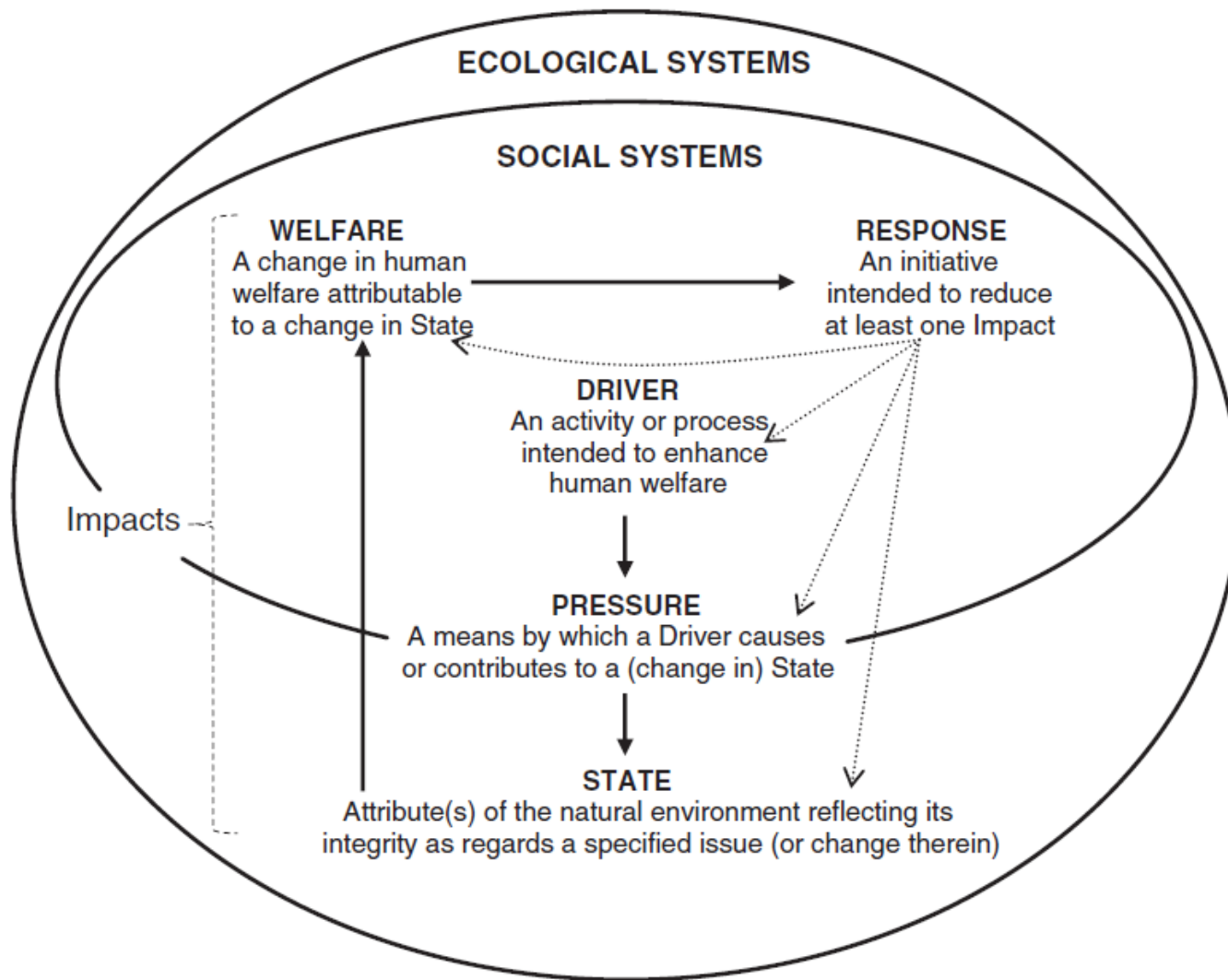
Indicatori benessere umano  Valore ricreativo			Benessere economico					Benessere sociale					Benessere personale
			Reddito	Occupazione	Abitazione	Infrastruttura	Sicurezza	Alimentazione	Demografia	Salute	Educazione	Tempo libero	
BENEFICIARI	INTERNI	Operatori turistici	X										X
		Residenti	X								X		X
	ESTERNI	Turisti									X		X
		Operatori turistici	X										X

Adattato da: Kandziora et al., 2012

Dal modello DPSIR...



... al modello DPSWR



—————> Direction of causal relationship
 - - - - -> Potential Response action

Alto Garda Bresciano - ZPS IT2070402
PRESSURE

- Indiretti**
- Aumento turismo a basse quote (E)
- Diretti**
- Scarsa manutenzione strade e reticolo idrografico (I)
 - Abbandono agricoltura e pascoli/habitat di specie
 - Invecchiamento popolazione (I)

Abbandono pascoli habitat di specie, diminuzione specie correlate diminuzione presidio sul territorio montano, minore manutenzione reticolo idrografico, diminuzione di prede (pecore), chiusura spazi aperti a favore del bosco

DRIVER

Obiettivi/misure di conservazione
Piano di Gestione 2010
Zona di Protezione Speciale
IT2070402 ALTO GARDA
BRESCIANO

STATE

Habitat
Cod.91K0= 46%
Cod.6170= 19%
Cod.6210=8 %

Specie
Specie: Gallo cedrone, Gallo forcello, Coturnice, Francolino di monte, Picchio cenerino, Aquila reale, Biancone, Civetta nana e Gufo reale

Stato di conservazione:
habitat: eccellente (%), buona (%), limitata (%), no data (%)
specie: eccellente (%), buona (%), limitato (%), no data (%)

SE
Valore ricreativo (ecoturismo)

WELFARE

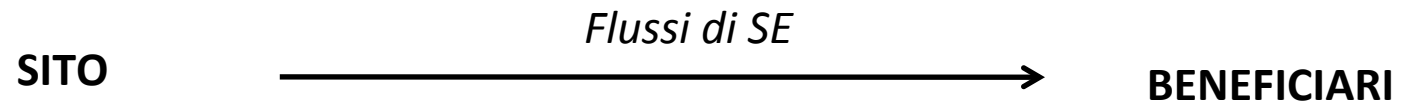
Beneficiari SE	Diretti	Indiretti
Interni	<i>Operatori turistici (alberghi, case vacanze, b&b, ristoranti), Residenti</i>	<i>Commercianti, indotto turistico indiretto</i>
Esterni	<i>Turisti (escursionisti, cicloturismo)</i>	<i>Commercianti, indotto turistico indiretto</i>

RESPONSE

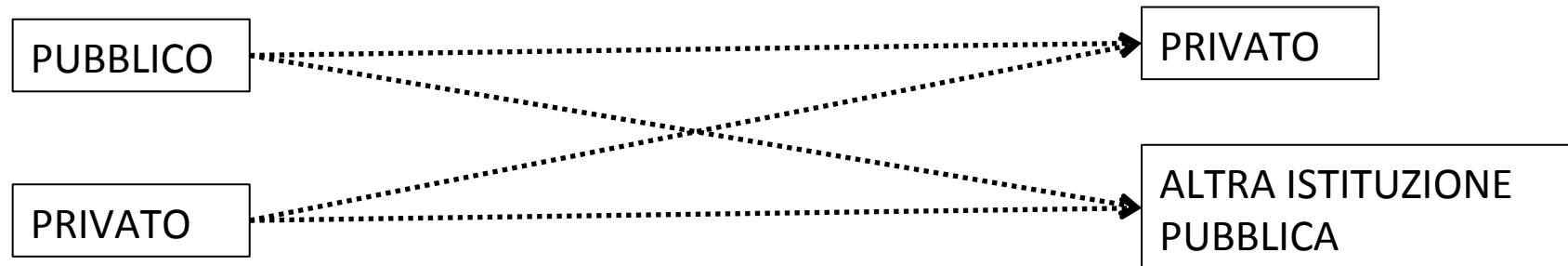
Ipotesi PES
Tassa di soggiorno, già esistente, che venga direzionata anche per coprire i costi organizzativi di microfiliera di prodotti tipici prodotti in quota per alberghi e ristoranti sul lago. In tal modo sostenendo la gestione degli habitat seminaturali quali i pascoli e la manutenzione del territorio

Ipotesi di soggetti PES
[Buyer=turisti supplier=operatorio turistici e ente gestore]

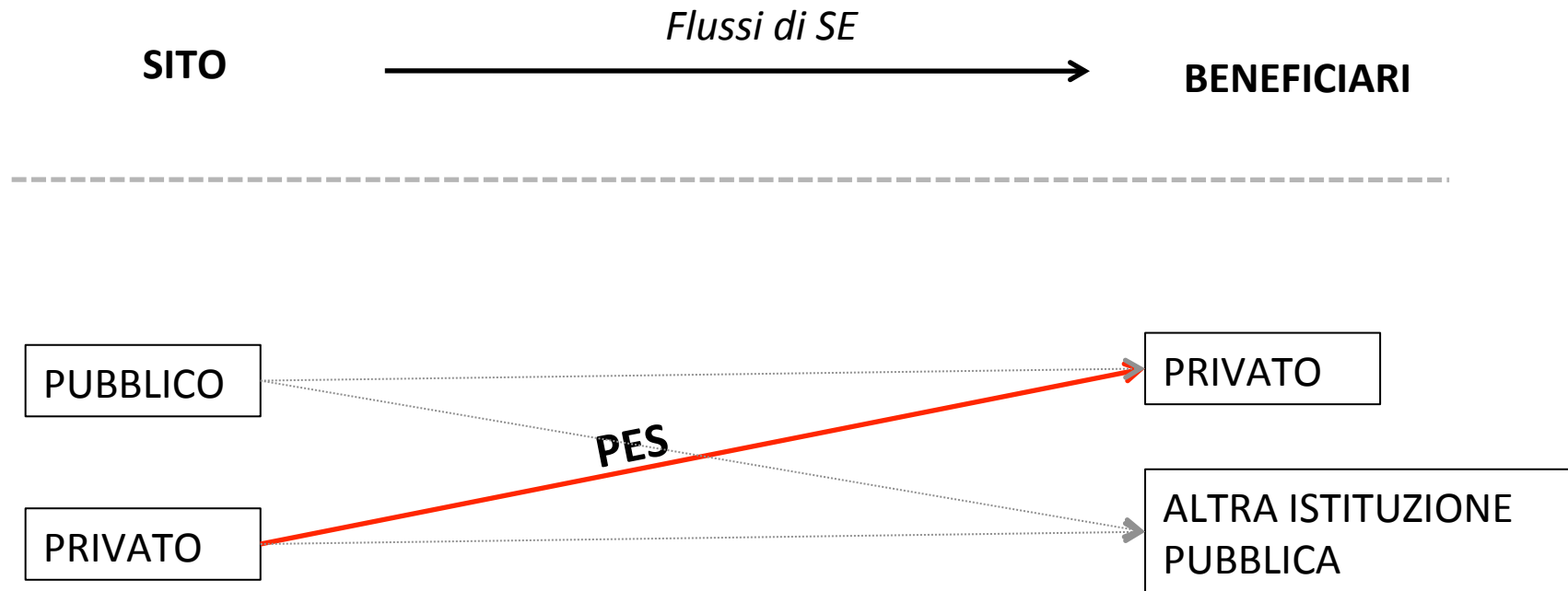
Relazioni tra produttori e beneficiari di SE



Quali diritti di proprietà? Quali rapporti territoriali?



Relazioni tra produttori e beneficiari di SE



ZPS IT4090006

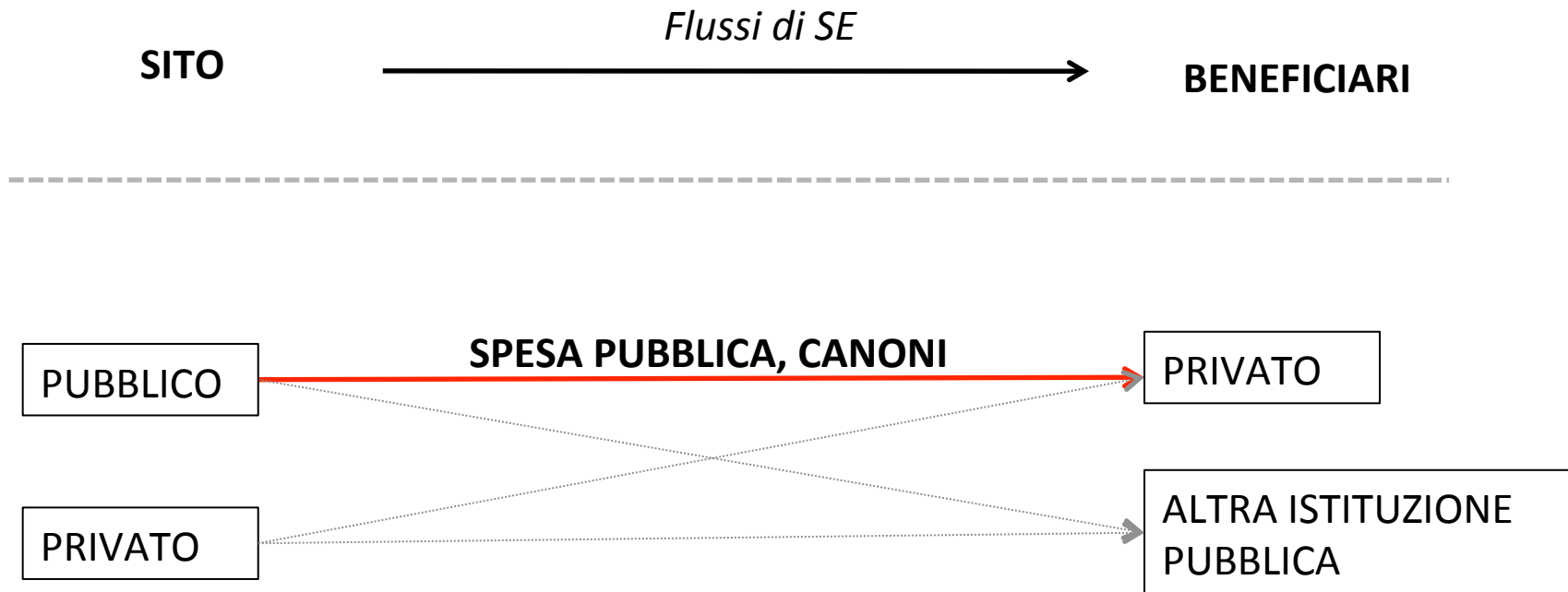
Versanti occidentali del Monte Carpegna, Torrente Messa, Poggio di Miratoio

Permesso di raccolta funghi basato sulla richiesta e sulla produzione annuale di funghi e tartufi; il pagamento per l'ottenimento del permesso potrebbe servire a remunerare i gestori dei boschi in cui si raccoglie il prodotto per i lavori di manutenzione e presidio.

Ipotesi governance SE

[Buyer=raccoglitori Supplier= agricoltori e proprietari forestali]

Relazioni tra produttori e beneficiari di SE



SIC IT9310014

La Fagosa-Timpa dell'Orso

Il Comune potrebbe destinare una **quota parte** della **tassa sui servizi idrici** agli operatori agroforestali per una corretta gestione dell'area inerente al bacino idrografico (conservazione di boschi, divieto di utilizzo di fertilizzanti, pesticidi, ecc.)

Ipotesi governance SE

[Buyer=Comune Supplier=imprese agricole e forestali]

GRAZIE DELL'ATTENZIONE!

dmarino@unimol.it

www.cursa.it

<http://www.lifemgn-serviziecosistemici.eu/>