

## Greener cities, healthier cities: facts and challenges



Fabio Salbitano and Giovanni Sanesi  
University of Florence – University of Bari

The World Health Organization (WHO) defined health in its broader sense in 1946 as

*“A state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity.”*



## Factors of health risk in Europe

- increasingly sedentary population,
- increasing levels of psychological stress related to urban living and contemporary work practices,
- and exposure to environmental hazards such as different kinds of pollution (global change included),
- diet richer in lipids, proteins and carbohydrates.


However, western society today is faced with the increasing incidence of various forms of poor health related to modern lifestyles.

In addition people with disabilities and chronic illness demand a transition from institutional care to care in society.

Lack of physical activity and stress, for example, have led to increase occurrence of certain diseases where medication is perhaps only reducing the symptoms rather than combating the true cases of illness and reduced quality of life. Efforts to promote public health and wellbeing in Europe have thus become increasingly complex.



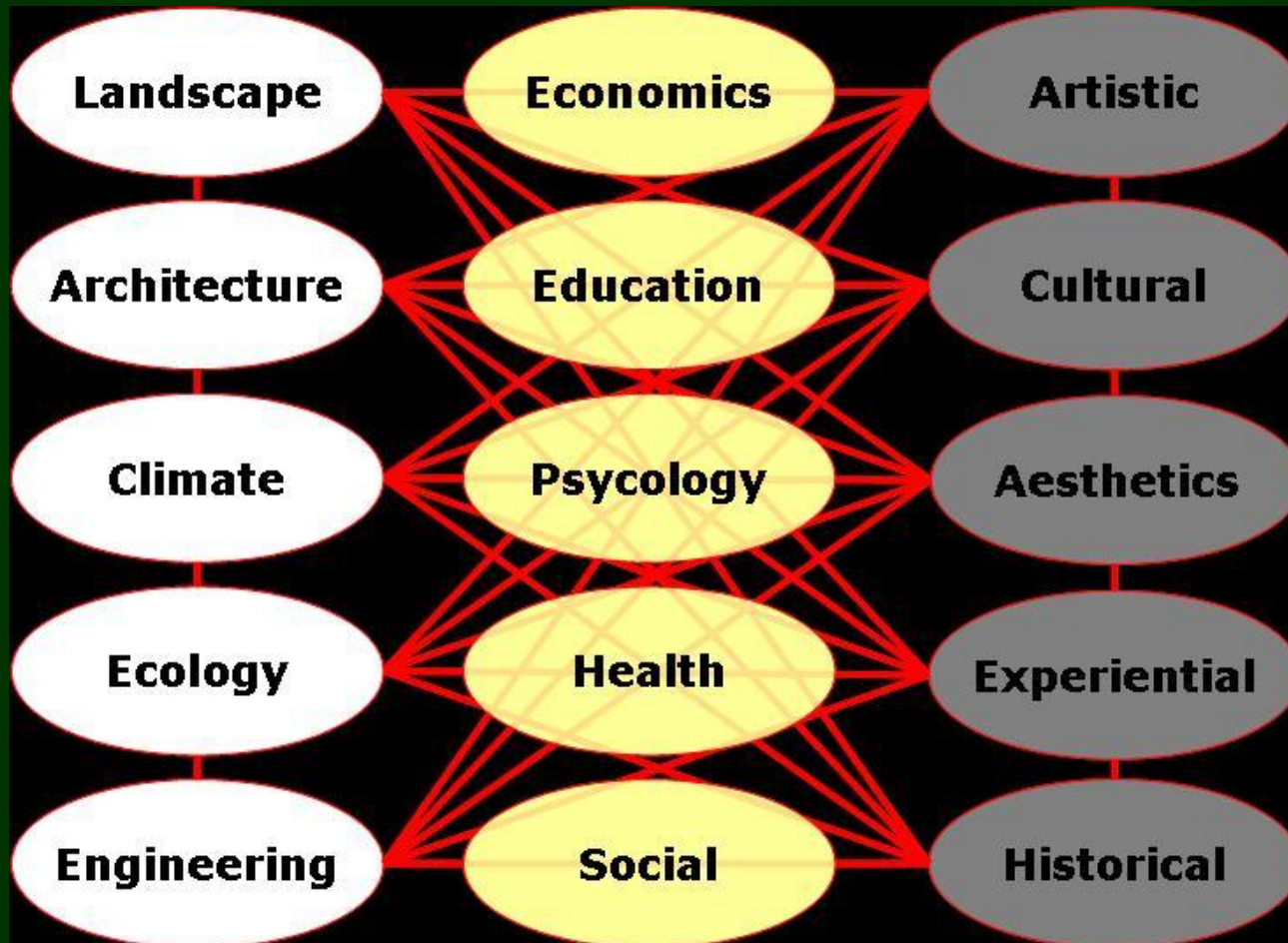




**This factors and current economical crises encourage thinking about alternative ways to prevent disease and promote health.**

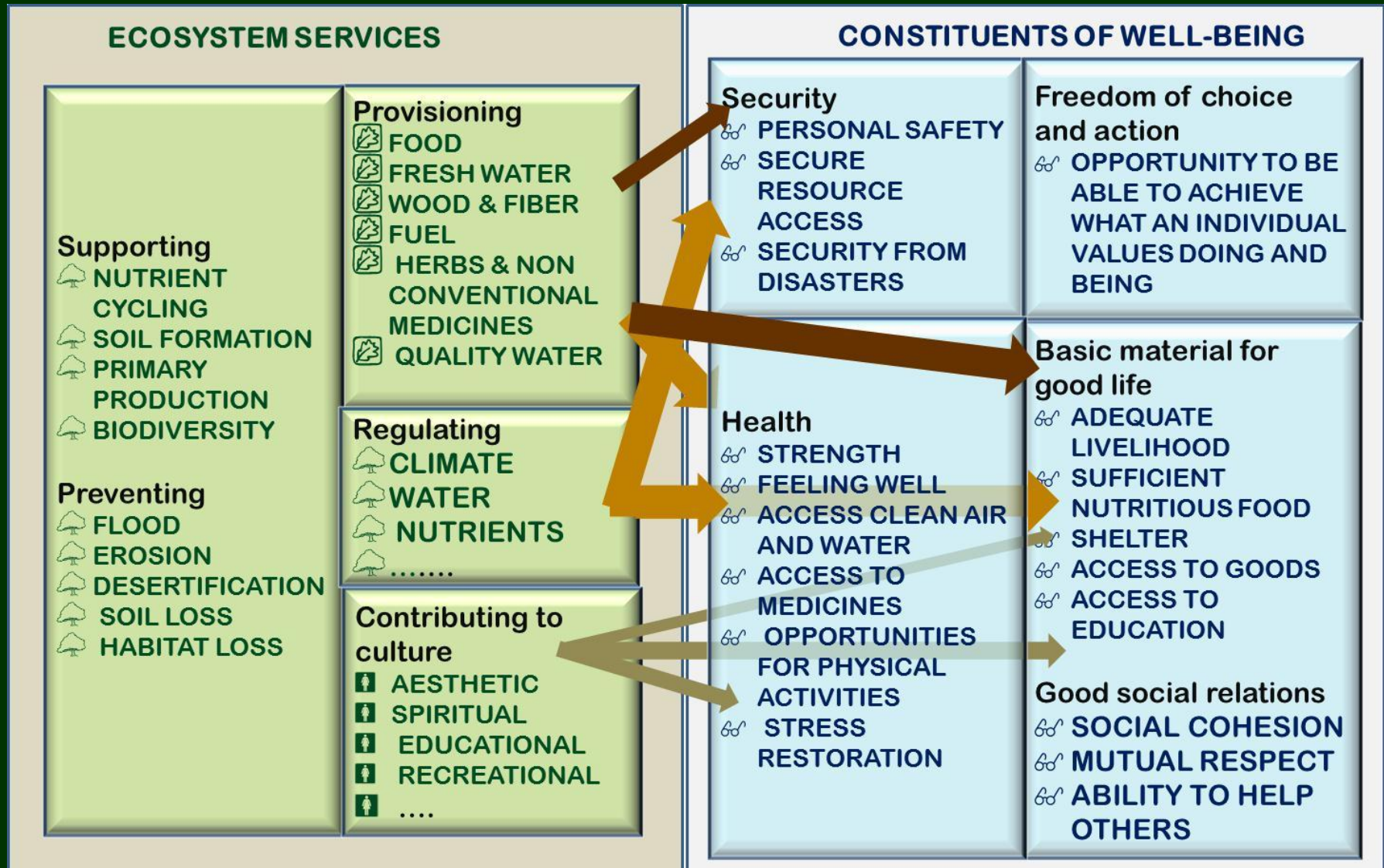
**At the same time new problems encourage new governance models in urban green spaces**

# How can “green” match the “health issues” in cities?





Ecosystem services can be broadly defined as environmental processes that support human health and well-being, either directly or indirectly



*Urban and Periurban Forest  
according to the benefits:*

**The Food Forest:** food, fruits & fodder

**The Social Forest:** improve general living conditions

**The Energy Forest:** fuelwood, charcoal, derived biofuel

**The Economic Forest:** jobs opportunities and employment

**The Climate Forest:** improve micro/macro climate, shading

**The Protecting Forest:** landslide & erosion prevention and control

**The Eco-Forest:** Biodiversity, Habitat, Carbon sequestration

**The Absorption Forest:** air-pollution & noise reduction

**The Healthy Forest:** reduction of stress, solar radiation

**The Wild Forest:** nature nearby, educational value

**The Classy Forest:** high-quality living & working

**The Forest Forever:** sustainability, future



# Facts

## Urban climate



Improving the thermal comfort using Green structures and infrastructures (Stuttgart , Germany)



### Monthly average (2005-2009):

Daily Minimum (Min) and  
Maximum (Max) site A and site B

### Monthly maximum (2005-2009):

Difference (B-A) of daily min.

Difference (B-A) of daily max.

The cooling effect of the green  
area was:

always approximately 1°C for  
minimum T and AT .

2.6-2.9 for maximum T

2.9-3.3 for maximum AT

Florence, EFUF 2010

Masseti (2010)

## T Air Temperature (°C)

Index	Site	June	July	August
Min	A	16.6	18.9	18.2
	B	17.5	19.7	19.0
	Max(B-A)	1.1	0.9	1.1
Max	A	27.7	31.7	30.1
	B	30.1	34.3	32.5
	Max(B-A)	2.6	2.9	2.6

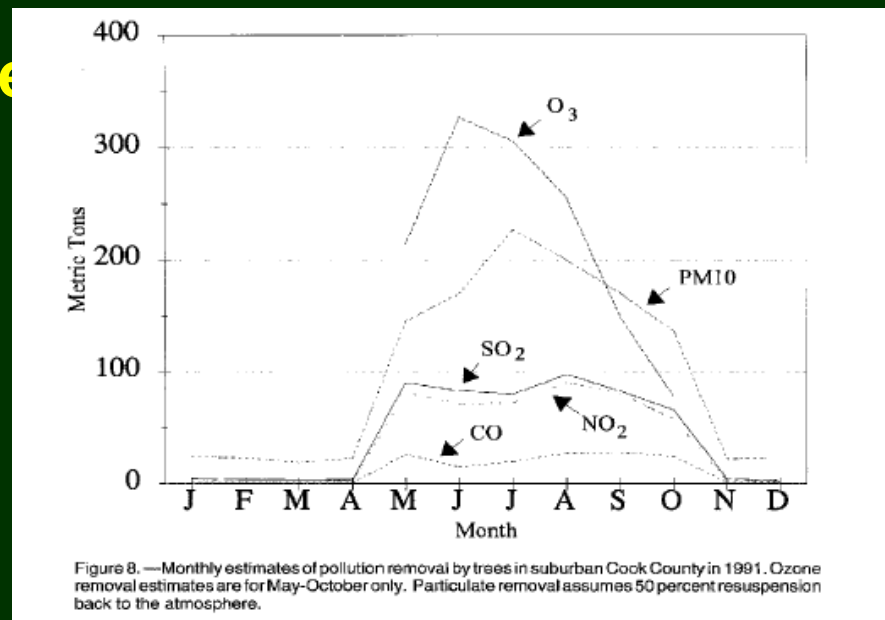
## AT Apparent Temperature (°C) or Heat index (Steadman, 1979)

Index	Site	June	July	August
Min	A	17.5	19.1	17.8
	B	18.4	20.0	18.7
	Max(B-A)	1.1	0.9	1.1
Max	A	28.8	30.8	29.3
	B	31.2	33.6	31.7
	Max(B-A)	2.9	3.3	2.9

# Facts

## Air quality Green cities and Urban Forest ecosystem services that impact

Source: McPherson et al. 1994



**Table 7.—Estimated removal rate per tree by d.b.h. class (kg/yr) and total annual dollar value per tree for removal of pollutants (see Table 8); particulate removal assumes 50 percent resuspension back to the atmosphere (multiply kg by 2.204 to convert to pounds)**

D.b.h. class	CO	SO <sub>2</sub>	NO <sub>2</sub>	PM10	O <sub>3</sub> <sup>a</sup>	Total	Dollars
0-7 cm	0.001	0.003	0.003	0.007	0.008	0.021	0.04
8-15 cm	0.003	0.008	0.009	0.021	0.023	0.064	0.10
16-30 cm	0.007	0.021	0.024	0.055	0.060	0.166	0.27
31-46 cm	0.017	0.054	0.062	0.141	0.153	0.428	0.70
47-61 cm	0.033	0.104	0.118	0.270	0.294	0.819	1.34
62-76 cm	0.043	0.136	0.155	0.355	0.385	1.074	1.76
77+ cm	0.056	0.178	0.204	0.465	0.505	1.409	2.31

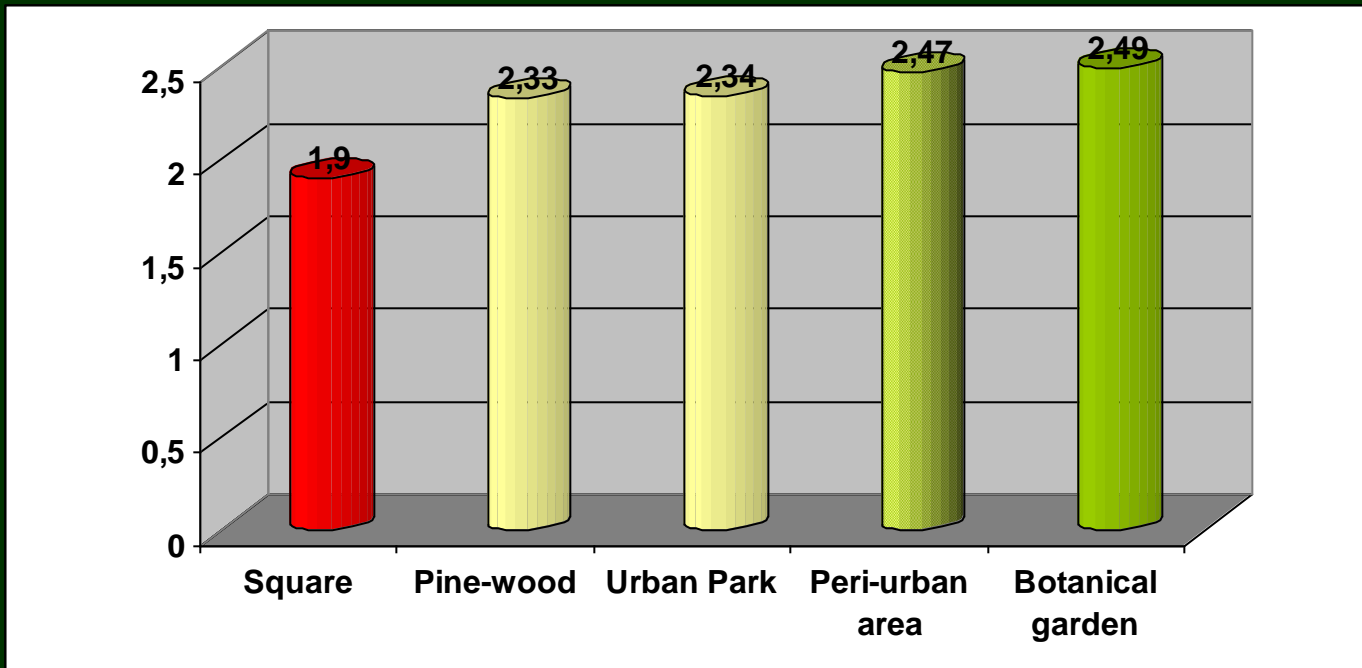
<sup>a</sup> May-October only.



# Facts

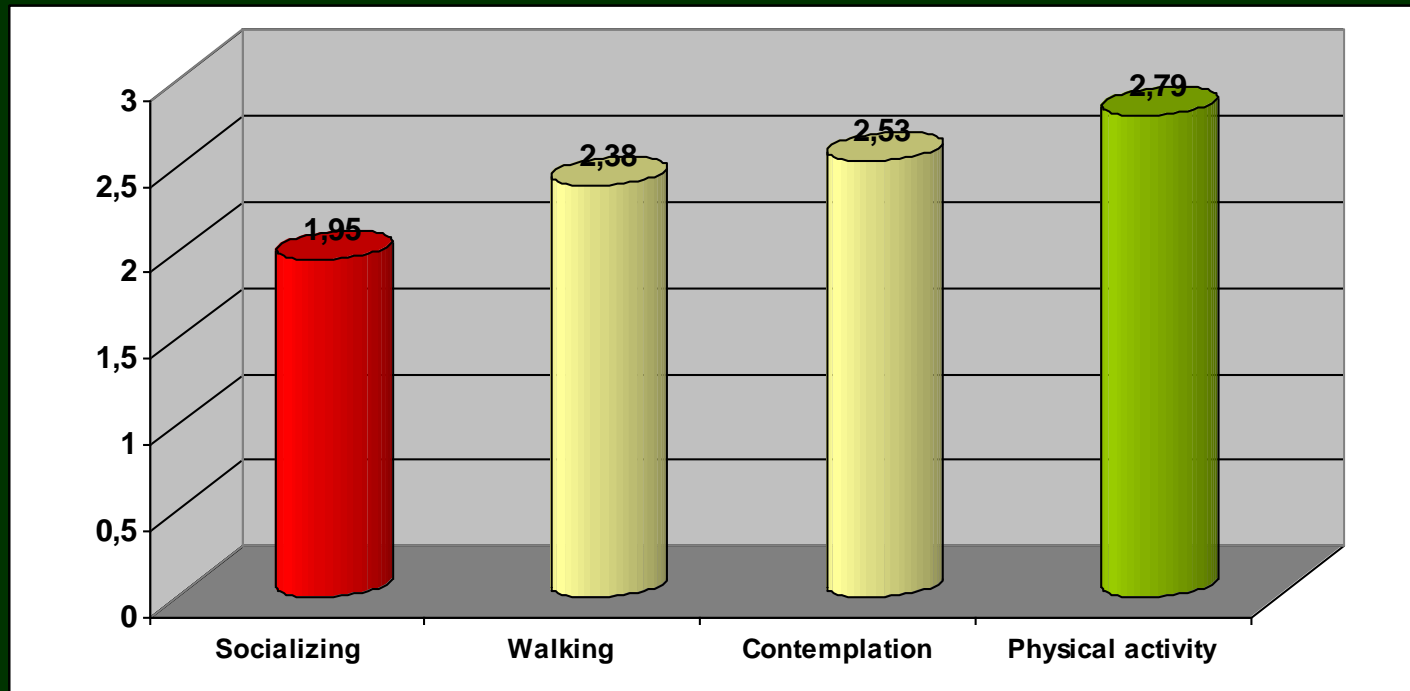
## Wellbeing

### Biodiversity and perceived restorativeness



Source: Carrus et al. 2011

# Preferred activities and perceived benefits



Source: Carrus et al. 2011

# Facts

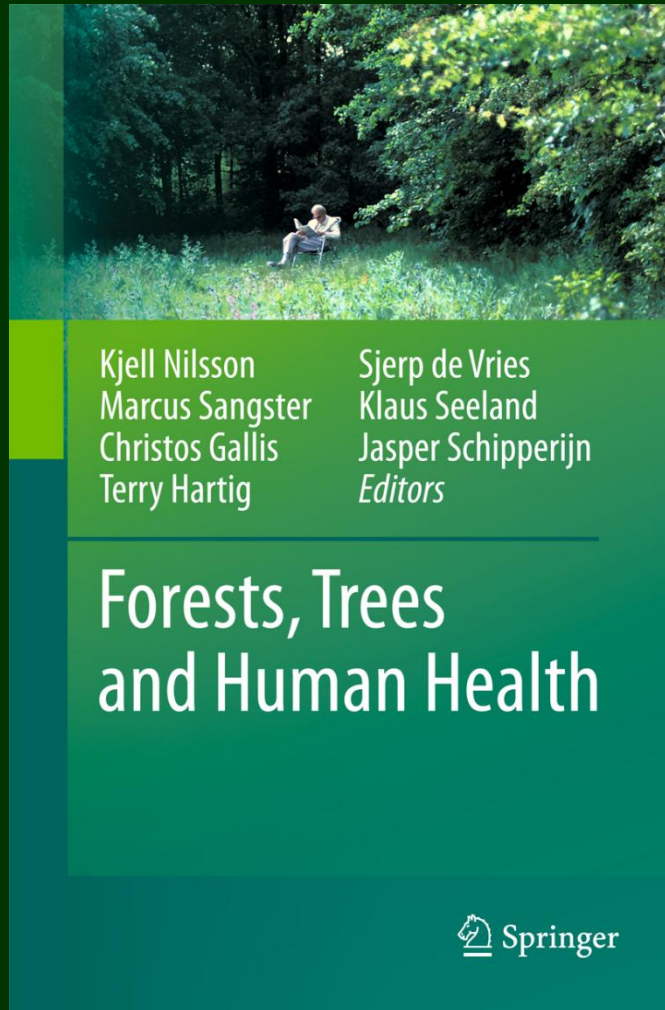
Green paths for improving physical activity and quality of life





# The lesson learned by COST E39

- ✚ **Health-related products from natural sources**
- ✚ **Human-animal interactions and green care**
- ✚ **Therapeutic interactions: plants and landscapes, garden therapy and ecotherapy**
- ✚ **Land use, accessibility to green areas and health effects: physical activities, reduced stress, mental disorders, non communicable diseases**
- ✚ **Settlements and localities: health and nature where we live - reduce heat stress, improve microclimate and thermal comfort**
- ✚ **Health policies and economics**



Kjell Nilsson  
Marcus Sangster  
Christos Gallis  
Terry Hartig

Sjerp de Vries  
Klaus Seeland  
Jasper Schipperijn  
*Editors*

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# Challenges

- Provide adaptive policies and specific strategies
- Think Green as investment for our common future;
- Share experiences;
- Go beyond the language and cultural problems between Green and White
- Provide more and more sound scientific data;
- Take the courage to design spaces tailored to citizens and eventually to therapies, treatment and rehabilitation;
- Promote an integrated planning ;
- Promote the participation, communication flow , information of all the possible actors and new model of Green space governance.



# Collaborations, partnerships

- All the actors, stakeholders and silent voices
- WHO
- UN Agencies (FAO, UN-HABITAT, UNEP, UNESCO, UNICEF, UNDP.....)
- EFUF – IUFRO
- ICLEI, RUAF, etc...
- European Agencies
- National Boards
- Hospital and Doctors
- Municipalities and Majors
- All the citizens

