

A wide-angle photograph of a modern urban landscape. On the left, a tall, curved skyscraper with a glass facade stands prominently. In the background, several other high-rise buildings are visible under a bright, clear blue sky. The foreground is dominated by a lush green lawn that leads to a small, winding stream or water feature. The overall scene is bright and sunny, suggesting a pleasant urban environment.

# MAIA WEBINAR: URBAN ECOSYSTEM ACCOUNTING VALUATION OF HEALTH BENEFITS OF URBAN GREENSPACE

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**April 29<sup>th</sup> 2021**

## 1. CASE STUDY SCOPE

**Case study:** Regional scale, Flanders, Belgium,  
with focus on all urban green spaces (cities, villages )

**Context:** selected as one of the 5 pilots for green accounting test in Flanders

### Potential users of results

- Land-use planners (regional, local ) : location, size, use of green spaces
- Managers of public urban green areas (parks,...): design, use
- Public health agency, prevention : role of open, blue green spaces in prevention
- Department environment: greening of economy
  
- Note: COVID pandemic showed importance of green areas in cities

## WHAT ? HEALTH BENEFITS EXPOSURE TO GREENSPACE

**Health benefits** = avoided physical and mental illness  
+ longer life expectations

From **greenspace** (% green area 1-3 km around place of residence)

“green” areas = **all** green land use, including  
parks, forests, agriculture, gardens (private and public)  
small informal green areas  
surface waters

exposure = contact with = recreation + sport + view on green + ...

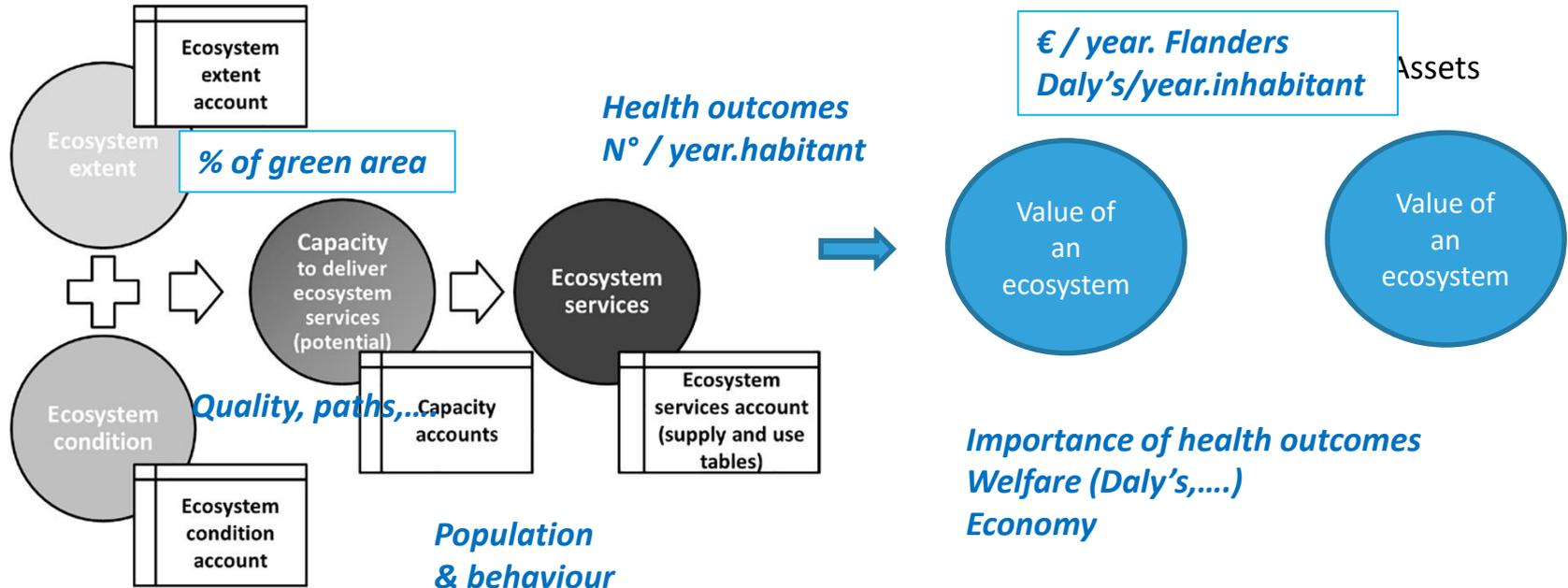
In addition to other benefits (e.g. the air pollution removal ) from green spaces

Benefits = avoided **health care costs** (e.g. hospitalization)  
+ **productivity** gains (less absenteeism)  
+ **welfare** gains (suffering, life years gained )

- (1) ECOSYSTEM EXTENT ACCOUNT,
- (2) ECOSYSTEM QUALITY ACCOUNT,
- (3) ECOSYSTEM SUPPLY AND USE ACCOUNT – PHYSICAL
- (4) ECOSYSTEM SUPPLY AND USE ACCOUNT – MONETARY
- (5) ECOSYSTEM ASSET ACCOUNT

### Physical accounts

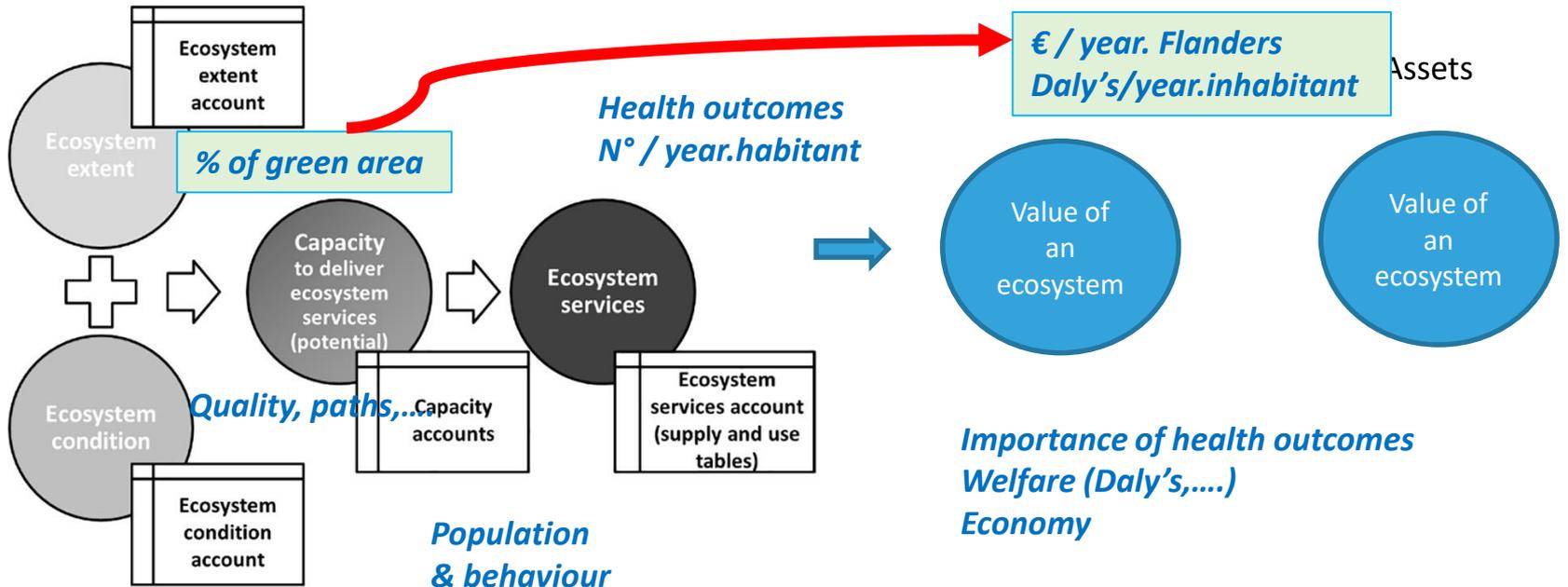
### Monetary accounts



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### Physical accounts

### Monetary accounts



## NOTE: HEALTH IMPACTS OF GREENSPACE

- Health accounting : Relationship with NCA
- Health impacts are important part of cultural ecosystem services partially overlap but are distinct from
  - Recreation ( broader definition of engagement with nature, stress release, informal green )
  - Impact of green on value of real estate (Basics for monetary valuation and beneficiaries differ)
- Outside the national accounting
  - Output (SEEA EA) vs health outcome
  - SEEA EA , discussed in ch12 Complementary approaches
  - Changes in land use (% of green areas; quality of green areas )
  - Differences between people with high and low % of green area (upper-lower quintile)

## 2. USEFULNESS FOR MUNICIPAL POLICY AND PLANNING (1)

### 1. + Indicates/confirms importance of all urban green for health

#### ***Strong scientific evidence for public health benefits***

- + Large, growing body of scientific literature on health benefits from green areas (epidemiology, experiments,...)
- + Show benefits for large number of health impacts (mental & physical morbidity, mortality )
- + Different mechanisms explain these impacts (stress release, exercise, social contacts,.. )

#### ***Possible to quantify and value these benefits***

Affects health endpoints that are important in total burden of disease

Difference between citizens in with upper or lower quintile of green for health status

Size of potential impacts (1 % GDP) justifies urban green areas as part of public health prevention policies (in addition to air quality,...)

(slide to show it is the case now in Flanders )

## 2. USEFULNESS FOR MUNICIPAL POLICY AND PLANNING (2)

### 2. Limitations

#### Green exposure indicators

- No single or best indicator in literature, limitation esp. for quality, accessibility and use
- Best indicator : % of green area in total land use around 1 – 3 km of place of residence
- Is a rough proxy for “contact with or exposure to natural environments”

#### Limitations for land use planners and urban green managers

- Challenging to assess changes over time (interpretation vs real changes)
- Rough indicator that does not reflect impact of policy measures that affect quality, accessibility, of green space

### 3. APPROACH: BACKGROUND

Strong scientific evidence (epidemiology, experiments,...) for public health benefits

Hard to interpret and implement for assessment of ecosystem services

- Indicators for green areas vary widely and/or are imprecise proxy for 'contact with'
- Limited comparability of studies and meta-analysis studies
- Different pathways of exposure and mechanisms for sub groups of population, green area's,

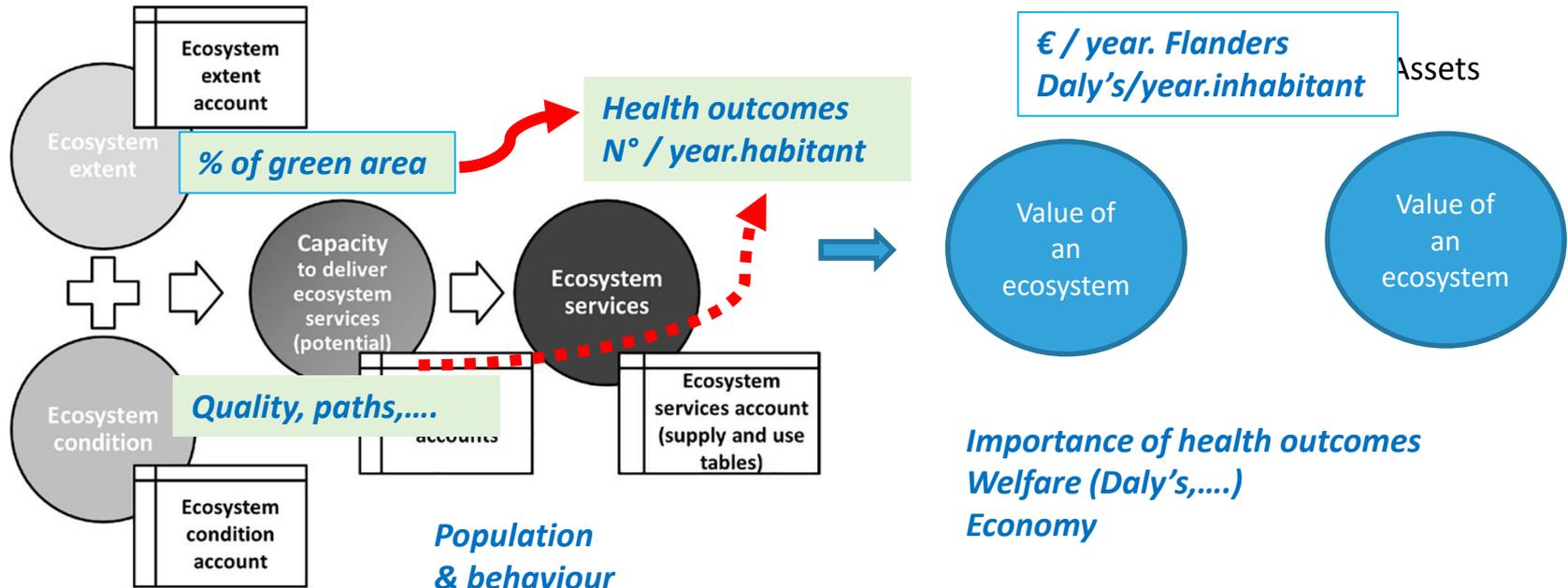
Green exposure indicator

- Best indicator : % of green area in total land use around 1 – 3 km of place of residence
- Requires detailed assessment of share of green areas, esp. in urban areas, and precise info over place of residence; Flanders : detailed land use map (10 x 10) + consistent interpretation

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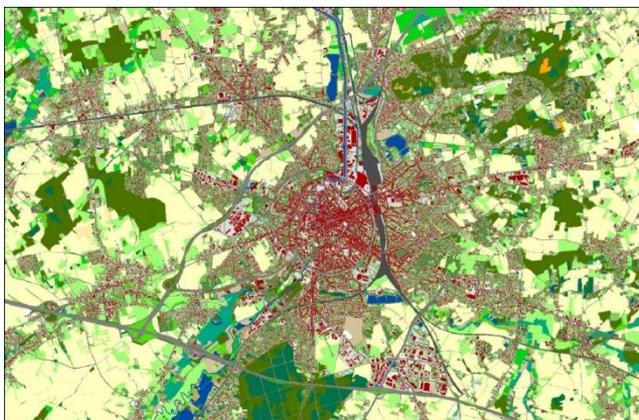
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## EXTENT ACCOUNT

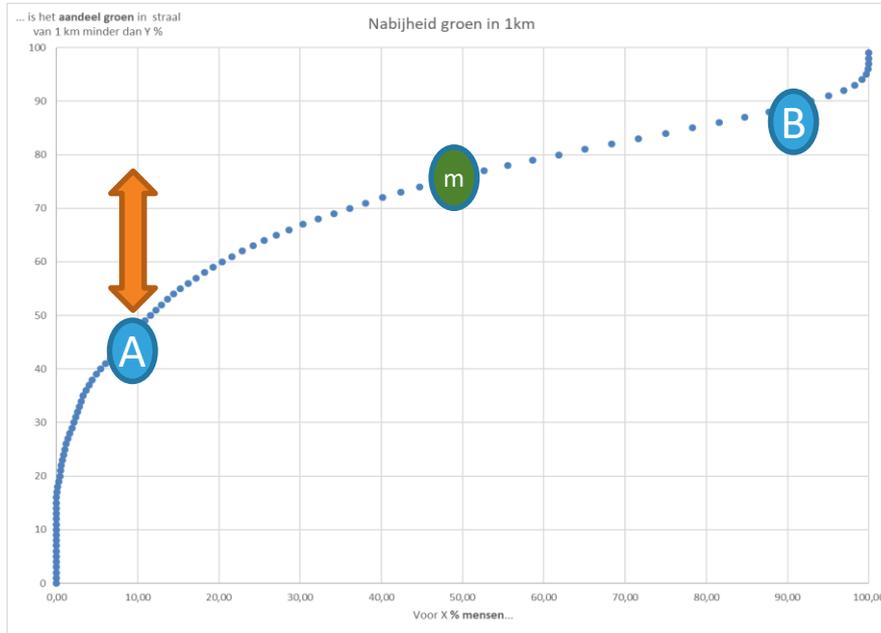
- VITO land use map
- 2013-2016
- 10x10m
- 22 categories



## 3. APPROACH: PHYSICAL ACCOUNTS SUPPLY AND USE

Share of greenspace in total land use in 1 km around place of residence, Flanders

% of green  
Area in  
Total land-use



Median: 73 % ( m )  
10 % has less then 48%

Presentation of results:  
difference in health outcome for  
inhabitants in the lower quintile (A)  
versus inhab in higher quintile (B) for %  
green areas

% of inhabitant with at least x % of green area

## 3. APPROACH: PHYSICAL ACCOUNTS SUPPLY AND USE

Dose response relationships from selected studies morbidity and meta-analysis (mortality)

Important : 2% - 5 % lower impacts for 10 % more green area

Total impact: - 9 % lower health impacts (Daly's)  
(disability adjusted life years)

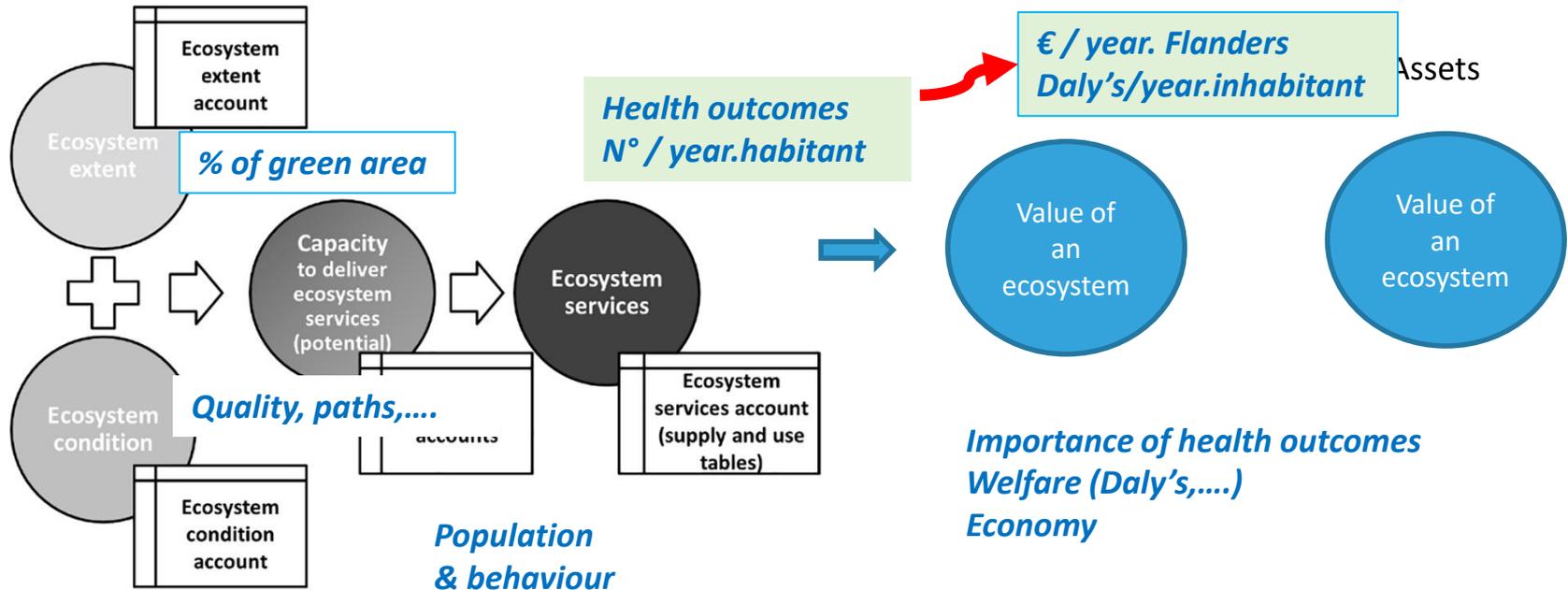
Inhabitants in the lower quintile (A in prev. slide)  
are expected to have e.g. + 12%-15 % more mental  
health impacts

	<b>+ 10 % Green area (1)</b>	
Dosis-effect relation	impact	95% interval
<b>Morbidity</b>		
<i>Mental health</i>		
Anxiety disorders	-5%	(-3% - -6%)
Depression	-4%	(-2% - -6%)
<i>Physical health</i>		
Coronary heart disease	-3%	(-1% - -5%)
Diabetes mellitus	-2%	(-1% - -3%)
Heart failure	-2%	(-1% - -3%)
Asthma	-3%	(-2% - -4%)
<b>Mortality (3)</b>		
cardio vascular	<b>-4%</b>	(-2% - -6%)
<b>Importance DALY /1000 inhab.</b>		
Mental health	-1,14	(-0,6 - -1,5)
Physical health	-0,95	(-0,5 - -1,8)
<b>Total morbidity</b>	<b>-2,36</b>	(-1,2 - -3,4)
<b>Mortality</b>		
Years life lost	<b>-1.5</b>	(-0,7 - -2,3)

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### Physical accounts

### Monetary accounts



### 3. APPROACH: MONETARY ACCOUNTS

Approach per type of health impact

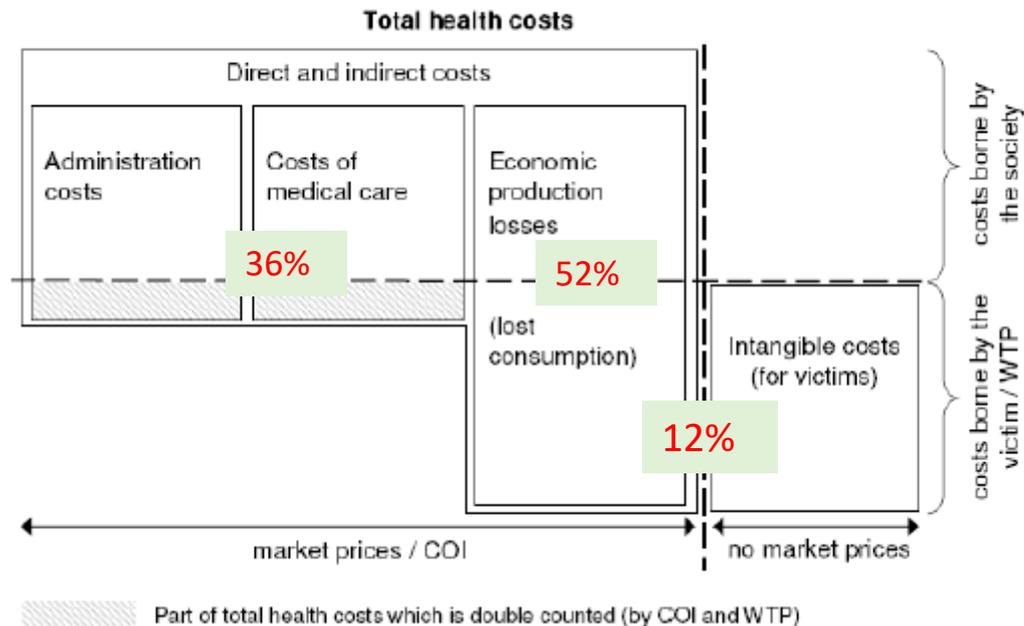
- **Avoided health costs:** costs of illness data from Belgium/European countries-studies  
Beneficiaries: health care sector, (patients)
- **Avoided absenteeism:** literature (Belgium/European) and wage costs (Belgium)  
Beneficiaries: Industry and services (patients)
- **Welfare gains:** valuation morbidity and years of life lost  
Beneficiaries: patients
  - More uncertain : Based on European, older studies
  - Additional to SEA framework ?

Important benefit: ballpoint estimate : 1 % of GDP

## WHO BENEFITS ?

### Beneficiaries (% of total benefits )

- Avoided health costs: 36 %
- Economy: Avoided absenteeism: 52 %
- People using green areas: 12 %



Bron: WHO, 2018

## BENEFITS PER HA AND LAND- USE CAT

On average: 3400 €/ha.year  
Limited variation between ecosystems, reflecting the population density around the ecosystems

Gezondheidsbaten (2016)†	Totale-gezondheidsbaten (1)‡			Baten-per-ha (2)‡		
	DALYs‡	Milj.-Euro‡	%‡	DALYs/ha‡	Euro/ha‡	Gem=100%‡
Landgebruik/ecosystemen‡						
Akkers‡	26-300‡	936‡	25%‡	0,07‡	2.312‡	68%‡
Overig-laag-groen‡	24-178‡	860‡	23%‡	0,19‡	6.845‡	201%‡
Cultuurgrasland-perm.‡	18-640‡	663‡	17%‡	0,08‡	2.768‡	81%‡
Overig-hoog-groen‡	13-615‡	484‡	13%‡	0,20‡	6.948‡	204%‡
Water‡	4-396‡	156‡	4,1%‡	0,11‡	3.977‡	117%‡
Loofbos‡	4-174‡	148‡	3,9%‡	0,09‡	3.093‡	91%‡
Naaldbos‡	3-247‡	115‡	3,0%‡	0,06‡	2.091‡	61%‡
Niet-geregistr.-landbouw‡	2-843‡	101‡	2,7%‡	0,12‡	4.237‡	124%‡
Ruigte-en-struweel‡	2-801‡	100‡	2,6%‡	0,12‡	4.355‡	128%‡
Halfnatuurlijk-grasland‡	1-981‡	70‡	1,9%‡	0,12‡	4.282‡	126%‡
Populieren‡	1-648‡	59‡	1,5%‡	0,10‡	3.500‡	103%‡
Alluviaal-bos‡	1-029‡	37‡	1,0%‡	0,10‡	3.418‡	100%‡
Laagstam-boomgaard‡	994‡	35‡	0,9%‡	0,06‡	2.202‡	65%‡
Kustduin‡	583‡	21‡	0,5%‡	0,18‡	6.437‡	189%‡
Heide‡	396‡	14‡	0,4%‡	0,03‡	1.217‡	36%‡
Moeras‡	224‡	8‡	0,2%‡	0,10‡	3.489‡	102%‡
Hoogstam-boomgaard‡	9‡	0‡	0,0%‡	0,11‡	3.750‡	110%‡
Slik-en-schorre‡	5‡	0‡	0,0%‡	0,04‡	1.268‡	37%‡
<b>Totaal-voor-Vlaanderen‡</b>	<b>107-061‡</b>	<b>3.808‡</b>	<b>100%‡</b>			
Gemiddeld-Vlaanderen (3)‡				<b>0,10‡</b>	<b>3.409‡</b>	<b>100%‡</b>

Ecosystemen zijn gerangschikt in functie van hun aandeel in de baten, en ingedeeld in 3 groepen volgens aandeel. ¶

- (1) → Hoge-schatting-voor-gezondheidsbaten-voor-inwoners-in-0,5-,1-en-1-tot-3-km-om-de-cel-met-groene-landgebruik,gemiddelde-Vlaanderen,2016.-Op-basis-centrale-schatting-voor-dosis-effect-relatie. ¶
- (2) → Gemiddelde-voor-alle-cellen-met-groene-landgebruiken. ¶
- (3) → Gemiddelde-Vlaanderen-=100%. ¶

## 4. EVALUATION AND PRIORITIES FOR FURTHER RESEARCH

- + Health impacts are important part of cultural ecosystem services partially overlap but are distinct from Recreation and Impact of green on value of real estate
- + Health accounting
- + More consistency in urban green indicators and their use for studies on public health and land-uses
- + Framework to integrate, new better indicators for “exposure to-engagement with green space “ , and link it with health indicators (e.g. cortisol levels in hair )
  - esp. for : - other locations (school, work, transport,...)
  - follow-up of evolution (cfr. MENE UK)
  - that reflects impacts of policies for quality of green space and promotion of engagement with nature

## GREEN AREAS AS PART OF PUBLIC HEALTH PREVENTION POLICIES IN FLANDERS, 2021



AGENTSCHAP  
ZORG &  
GEZONDHEID

Over ons | Voor burgers

Wat zoekt u?  **ZOEKEN**

Per domein | Procedures | Publicaties en documenten | Cijfers | Nieuws | Beleid

Home > Per domein > Preventie > Gezonde publieke ruimte > Project gezonde publieke ruimte

### Project Gezonde Publieke Ruimte

**Een gezonde publieke ruimte ... om ook de volgende generaties een leefbaar Vlaanderen te kunnen bieden waar het goed en gezond leven is!**

We staan voor een aantal uitdagingen zoals luchtverontreiniging, lawaaihinder, klimaatveranderingen, uitputting van grondstoffen, ruimte-inname, enzovoort. Willen we ervoor zorgen dat het hier nog leefbaar en aangenaam blijft, dan zullen we enkele moeilijke maar belangrijke keuzes moeten maken. We gaan voor een bouwshift die het pad verlaat van de versnipperde bebouwing die Vlaanderen zo typeert en volop inzet op kernversterking. We dringen verdere bodemverharding terug, beperken de autoafhankelijkheid en het autogebruik, en bouwen zo aan een milieuvriendelijke en klimaatbestendige ruimtelijke structuur, om de leefbaarheid in Vlaanderen ook in de toekomst verder te waarborgen en te verhogen.

**Ook vanuit gezondheid is dit belangrijk**

Kijken we naar de definitie van gezondheid zoals geformuleerd door de Wereldgezondheidsorganisatie (WHO), namelijk 'Een toestand van volledig lichamelijk, geestelijk en maatschappelijk welzijn en niet slechts de afwezigheid

**Project gezonde publieke ruimte**

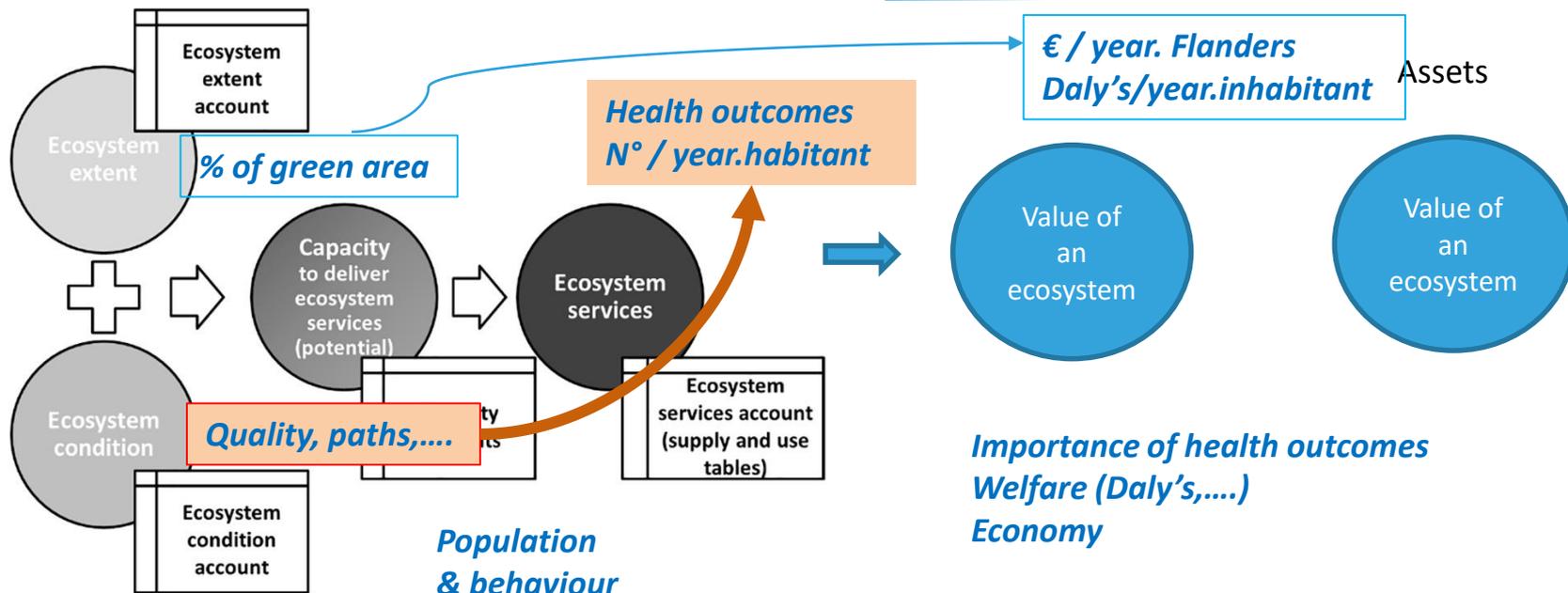
*Ga naar het project >*

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## NOTE :PERCEPTION BY PUBLIC

Health related indicators  
in public surveys  
(source : UK MENE)

Figure 14 Reasons for visits by activities undertaken (% of visits 2018/19)

	Walking a dog	Walking without a dog	Eating & drinking out	Playing with children	Running	Wildlife watching	Visiting an attraction*
Health/exercise	68%	59%	47%	55%	92%	64%	24%
Relax & unwind	53%	30%	37%	45%	59%	53%	37%
Enjoy scenery	34%	26%	31%	28%	30%	43%	36%
Time with family	27%	11%	32%	60%	13%	37%	33%

Q12 Which of the following, if any, best describe your reasons for this visit?

\* Only includes visits to attraction within visits to the outdoors (see survey scope on page 3)

■ At least once a week   
 ■ Once or twice a month   
 ■ Less than once a month or never

White British

Figure 22 Frequency of visits by health & life satisfaction (% of adults in each group – 2018/19)



## FURTHER INFORMATION

### Nature value explorer

<https://vito.be/en/nature-value-explorer>

<https://natuurwaardeverkenner.be>

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### Vito

Vito, Environmental Modelling, Land and Water Management

<https://vito.be/en/application-area/water-cities>

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