



URBAN RE-NATURING

SERVICES ÉCOSYSTÉMIQUES URBAINS ASSOCIÉS AUX «SOLUTIONS BASÉES SUR LA NATURE»: ENJEUX ET OPPORTUNITÉS

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Colloque

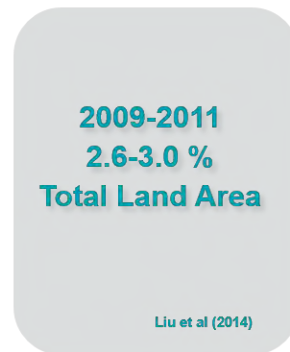
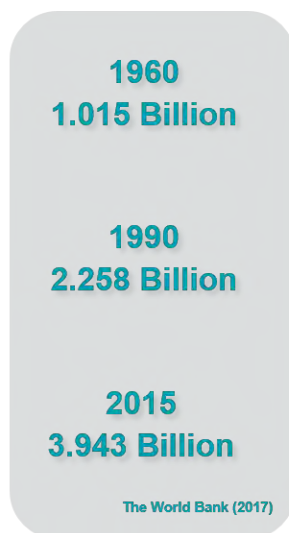
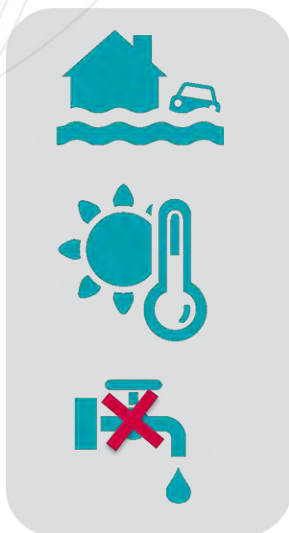
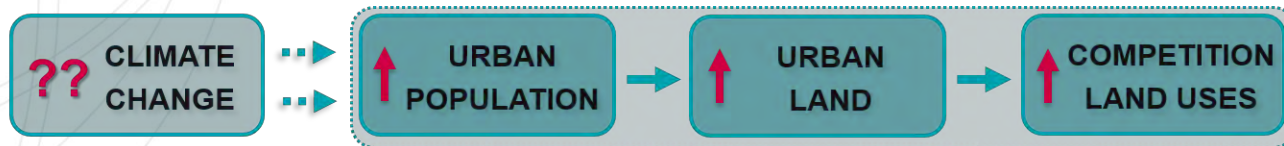
Green Space in Urban Areas

Espaces verts en milieux urbains | 18 Mai 2017

LUXEMBOURG
INSTITUTE OF SCIENCE
AND TECHNOLOGY



Urban challenges ...



Mountains, Moorlands & Heaths

Food
Fibre
Fuel
Fresh water
Climate regulation
Flood regulation
Wildfire regulation
Water quality regulation
Erosion control
Recreation & Tourism
Aesthetic values
Cultural heritage
Spiritual values
Education
Sense of place
Health benefits

Semi-natural Grasslands

Food
Biofuels
Fresh water
Genetic resources
Climate regulation
Air & water quality regulation
Recreation & Tourism
Aesthetic value
Cultural heritage
Spiritual values
Education
Sense of place
Health benefits

Enclosed Farmland

Food
Fibre
Biofuels
Fresh water
Climate regulation
Pollution control
Water quality regulation
Pollination
Disease and pest control
Recreation
Aesthetic values
Cultural heritage
Education
Sense of place

Woodlands

Timber
Fuelwood
Fresh water
Species diversity
Climate regulation
Erosion control
Flood regulation
Disease & pest control
Air & water quality regulation
Soil quality regulation
Noise regulation
Recreation & Tourism
Aesthetic values
Cultural heritage
Education
Employment
Sense of place

Freshwaters - Openwaters, Wetlands & Floodplains

Food
Water
Fibre
Peat (horticulture/fuel)
Navigation
Bioenergy
Health products
Climate regulation
Water regulation
Water quality regulation
Fire hazard regulation
Recreation & Tourism
Aesthetic values
Cultural heritage
Spiritual values
Education
Health benefits

Urban

Genetic resources
Air & water quality regulation
Noise regulation
Local climate regulation
Flood regulation
Pollination
Recreation & Tourism
Aesthetic values
Cultural heritage
Spiritual values
Education
Sense of place
Health benefits

Coastal Margins

Food
Cooling water (nuclear power stations)
Land for military exercises
Pharmaceutical products
Wild species diversity
Coastal defence
Water quality regulation
Pollution control
Recreation & Tourism
Aesthetic values
Cultural heritage
Spiritual values
Education
Sense of place
Health benefits

Marine

Food
Pharmaceutical products
Pollution control
Climate regulation
Recreation & Tourism
Aesthetic values
Cultural heritage
Education
Sense of place

Ecosystem services ...

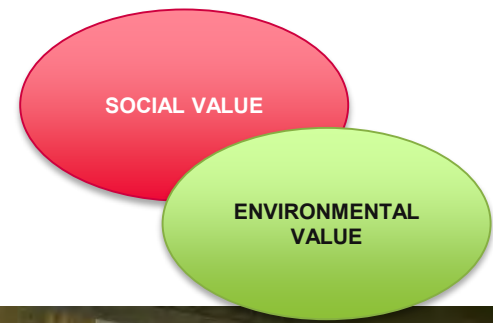
Buffalo Bayou Promenade Regeneration (USA)



Source: Scenario Journal (Author: SWA)
<http://scenariojournal.com/strategy/buffalo-bayou-promenade/>



Source: LANDEZINE (Author: SWA)
<http://www.landezine.com/index.php/2015/09/buffalo-bayou-promenade-by-swa/>



Buffalo Bayou Promenade Regeneration (USA)



Source: Archdaily (Author: SWA)
<http://www.archdaily.com/211418/romanesque-cistern-re-discovered-under-buffalo-bayou-park-in-houston/buffalobayoumasterplan-shepherd-to-sabine-2012-water-music-place-far-rt-low-res>



Source: Scenario Journal (Author: SWA)
<http://scenariojournal.com/strategy/buffalo-bayou-promenade/>

SOCIAL VALUE

ENVIRONMENTAL
VALUE

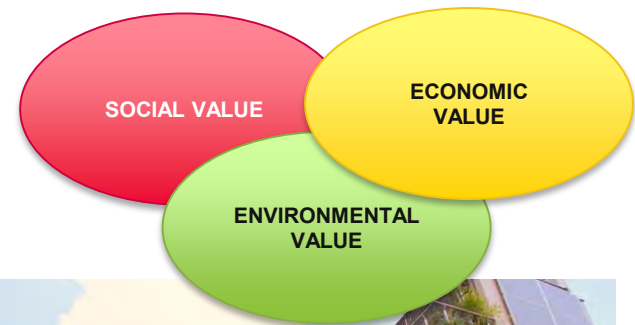
Crossrail roof garden – North Dock of London's Dockland



Source: Landscape Institute (UK) – Case studies
<https://www.landscapeinstitute.org/case-studies/>



Source: NotQuiteEnough Blog
<http://www.notquiteenough.co.uk/>



Greenest Hotel in Vienna (Stadthalle Hotel)



Source: Boutique hotel stadthalle
www.hotelstadthalle.at



Source: Boutique hotel stadthalle
www.hotelstadthalle.at

SOCIAL VALUE

ECONOMIC VALUE

ENVIRONMENTAL
VALUE

Social Urban Allotments – Ecological Agriculture Approach (Burjassot, Spain)



From Brownfield to Allotments



Relation of aromatic vegetation that attract useful fauna for pest control and allotments



■ Main Shrubland attractor of useful fauna

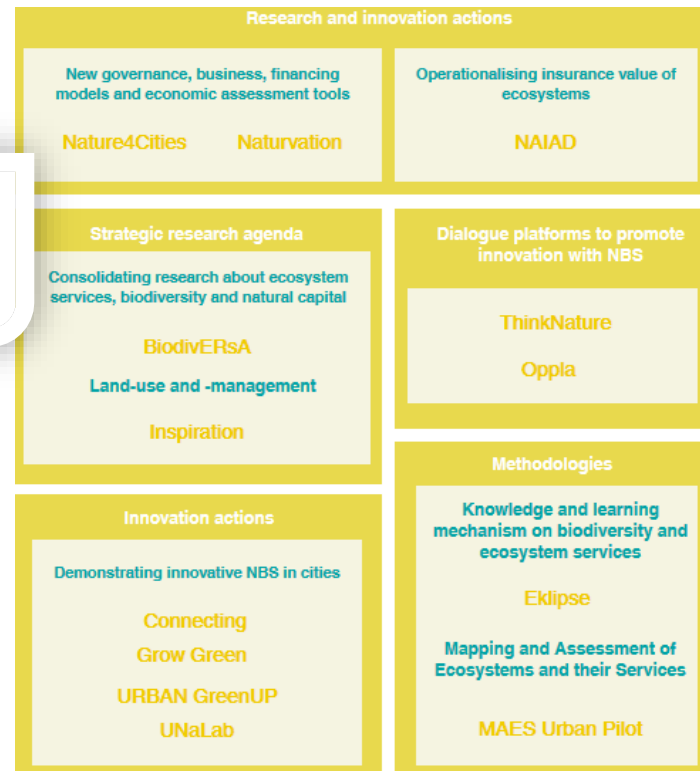
● Small groups of aromatic plants placed in the allotments

--- Shortest path between attractor plants

Nature-Based Solutions (NBS)

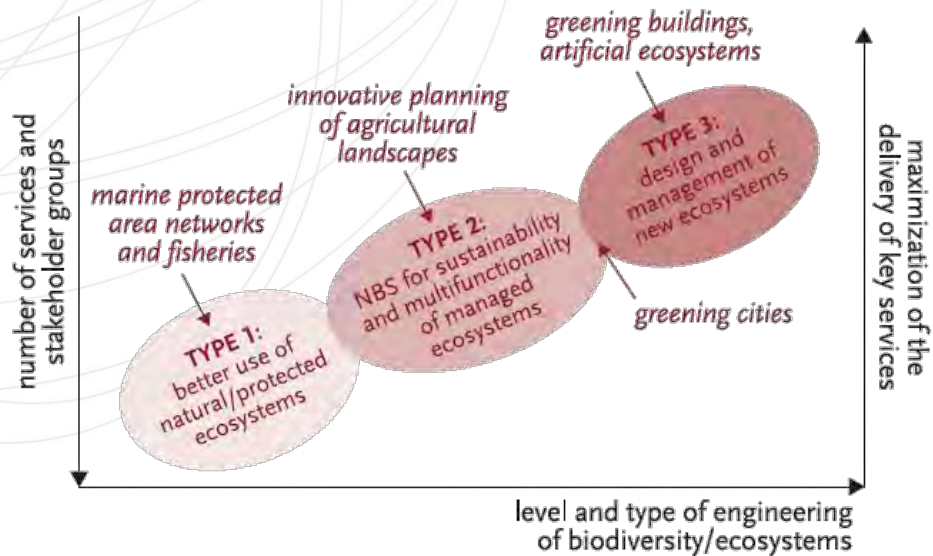
EU definition (2015)

NBS are *positive responses to societal challenges*, and can have the potential to simultaneously *meet environmental, social and economic objectives*. They are actions *inspired by, supported by or copied from nature*; both using and enhancing existing solutions to challenges, as well as exploring more novel solutions.

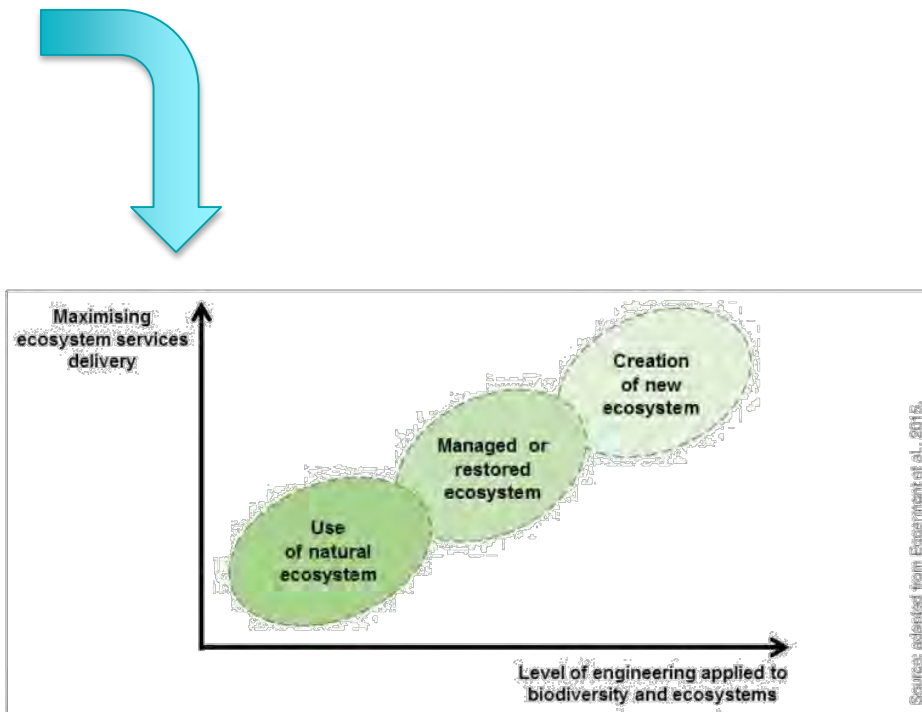


NBS are ideally *resilient to change*, as well as *energy and resources efficient*. They recognise the importance to develop a systemic approach and at the same time to *adapt interventions to the local context*.

From NBS typologies to urban ecosystem services...

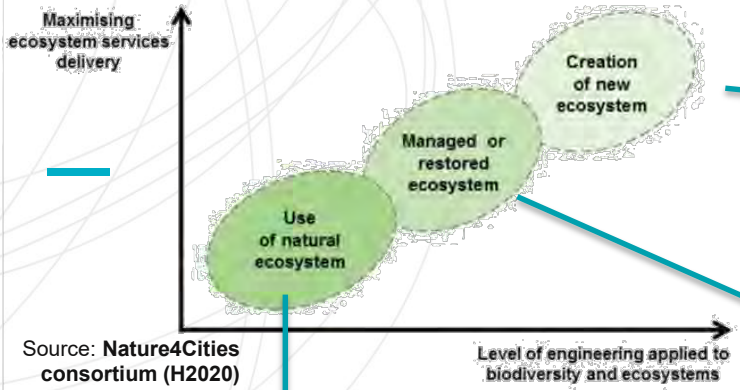


Source: Eggermont et al., *GAIA* 24/4 (2015): 243 – 248



Source: adapted from Eggermont et al., 2015.

Source: Nature4Cities consortium (H2020) A typology of NbS showing three main categories of solutions based on natural, restored and new ecosystems



Use of "Natural Ecosystems" in Periurban Areas



Gaalgebierg Periurban Forest (Esch-sur-Alzette)

Source:
<http://www.visitluxembourg.com/en/place/walking/circular-walk-esch-sur-alzette>

Restored Ecosystems in Urban Areas



Restored wetland and riverine vegetation in Cabecera's Park (Valencia, Spain)

Source:
<http://www.canonistas.com/foros/fauna/154453-parque-de-cabecera.html>

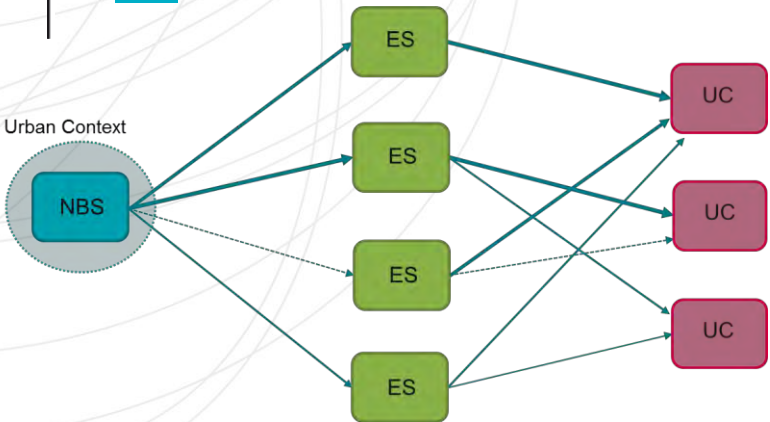
Creation of New Ecosystems in Urban Areas



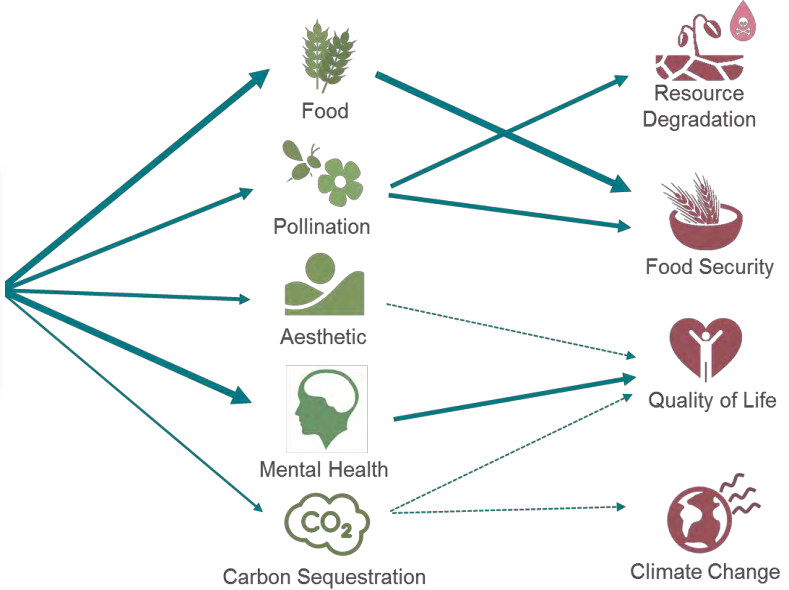
Patrick Blanc's Lush Vertical Garden in Caixa Forum (Madrid, Spain)

Source: <http://inhabitat.com/patrick-blancs-lush-vertical-garden-is-a-green-oasis-in-the-middle-of-madrid/vertical-living-wall-madrid2/>

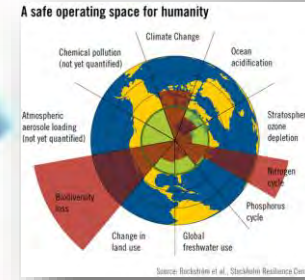
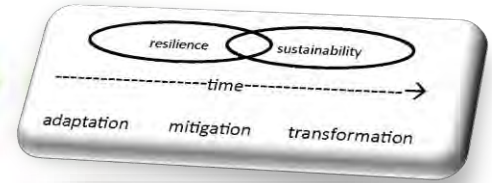
Urban challenges (UC)
Nature based solutions (NBS)
Urban ecosystem services (ES)



(urban) allotments



Still several questions behind the implementation of NBS in cities...



Our proposals...

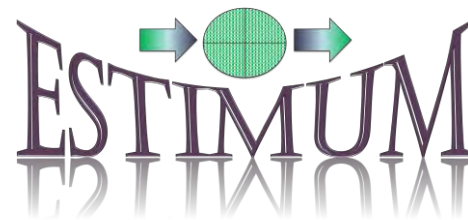


<https://www.nature4cities.eu/>



LIST:
WP leadership

GOALS: (1) to build a **NBS knowledge base** and associated **integrated analysis framework**, (2) to develop a **holistic assessment methodology**, (3) to adapt existing **technologies for urban data management and citizens' participatory engagement**, and (4) to **co-develop and demonstrate** with partner cities



FNR CORE
2016

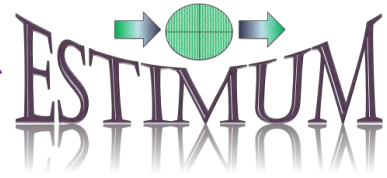


Luxembourg National
Research Fund

LIST:
Coordination

AIM: to develop an **integrated multi-scale dynamic object-based modelling and operational tool** for **scenario analysis of urban metabolism** designed to assess the **value of ecosystem services** under different socio-economic and environmental conditions (**test-bed implementation of the tool** in three different urban contexts)

Case studies



LISBON

Portugal



ESCH-SUR
ALZETTE

Luxembourg



MILAN

SIENA

Italy



CANKAYA
(ANKARA)

Turkey



SZEGED

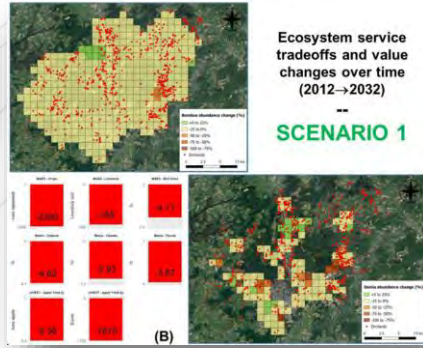
Hungary



ALCALA DE
HENARES

Spain

Approach

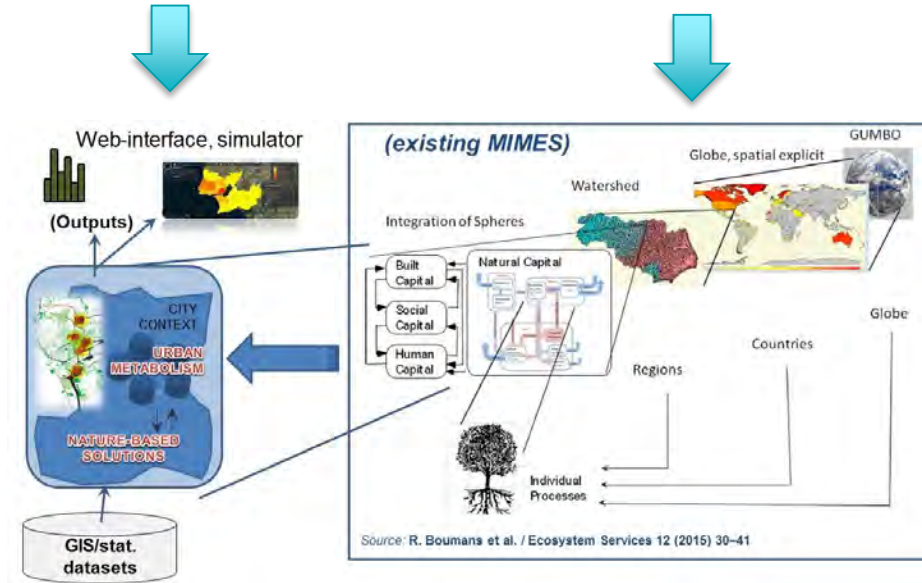
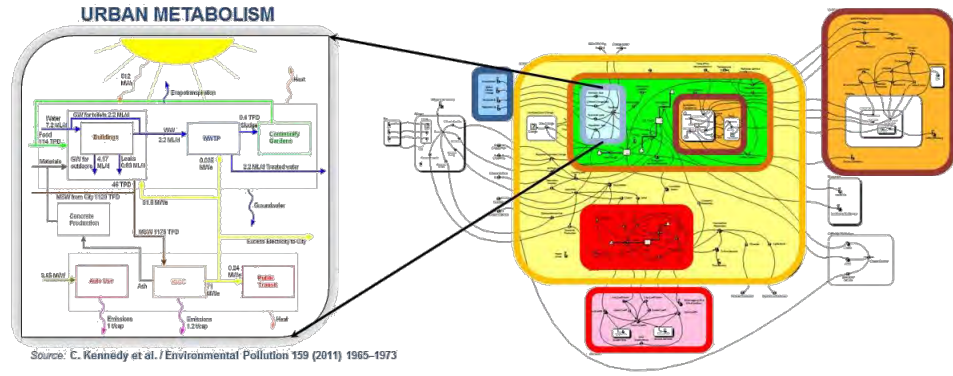


Socio-economic impact assessment scale...



Smart City and Region Platform architecture – LIST

- GeoSim Tools**
 - Energy Planning
 - Water Management
 - Air Quality
 - Land Use Change
 - Flood & Heat Risks
 - Urban Agriculture
 - Ecosystem Services
 - Life Cycle Assessment
- Web Interface**
 - Analytics & Decision tools
 - Scenario tools
 - Interface to GeoSim tools
 - Interactive GIS Mapping
 - Data outgating and linking
- Web Service communication layer** (SOAP, REST, WSDL, SOAP, REST, WSDL)
- iGuess**
- DATA CATALOGUE**
- ENERGY TOOLS**
- INTERACTIVE MAPS**
- External GeoSim & Analysis Services**
- Sensors, Earth Chs, Geoportals...**
- External Data Services**





“Paris Smart City 2050” by Vincent Callebaut

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MERCI !!



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