

My profile (in short)

Laureata Sc. Naturali
Dottorato in Sc. Del suolo
Master Carbon Manager



Socia della
Semisardi, piante
officiali

Membro della delegazione
italiana Convenzione ONU
sui cambiamenti climatici
(UNFCCC) e Convenzione
per diversità biologica
(UNCBD) e del G20



Cooperazione internazionale in
Mozambico
Ricerca sul suolo e microrganismi
del suolo CREA
Ricerca in inquinamento
atmosferico -CNR (2 anni in Cina)





G20
ITALIA
2021

The logo is a blue square with a yellow circle around it. The text 'G20' is in white, 'ITALIA' is in yellow, and '2021' is in white. Below the square is a small Italian flag.



ENERGY AND CLIMATE

The background of the slide is a faded drawing of Leonardo da Vinci's Vitruvian Man. The figure is inscribed within a square and a circle. The drawing is in pencil and shows the man's arms and legs extended to touch the sides of the square and the top and bottom of the circle.

Il ruolo delle soluzioni basate sulla Natura nel G20 clima energia

Barbara D'Angelo



Contesto

- 2021 anno chiave per la lotta ai cambiamenti climatici
- Italia protagonista la Presidenza del G20 e la co-Presidenza della COP26 con il Regno Unito-organizzazione della Pre-COP 26 e dell'evento Youth for climate

Priorità' tematiche comuni del G20 Clima-Energia

Il nesso clima-energia è stato affrontato attraverso la declinazione delle seguenti tematiche:

- *Sustainable Recovery* e opportunità tecnologiche
- Città intelligenti, resilienti e sostenibili (*Smart, resilient and sustainable cities*)
- Finanza verde e stimoli alla ripresa sostenibile

CITTA' INTELLIGENTI RESILIENTI E SOSTENIBILI



Perché



Come



Cosa



CITTA' INTELLIGENTI RESILIENTI E SOSTENIBILI

- I paesi del G20 congiuntamente sono responsabili per l'80% delle emissioni globali e per l'85% del PIL globale
- Le città sono le aree più vulnerabili ai cambiamenti climatici
- Le aree urbane ospitano attualmente circa il 55% della popolazione mondiale e il 70 % dell'economia globale. Si prevede che queste cifre cresceranno rispettivamente fino al 70% e 85 % entro il 2050
- Le soluzioni basate sulla natura (*nature-based solutions* – NBS) offrono soluzioni efficaci per l'adattamento e per la mitigazione apportando al contempo molteplici benefici.



Workshop NBS (G20)

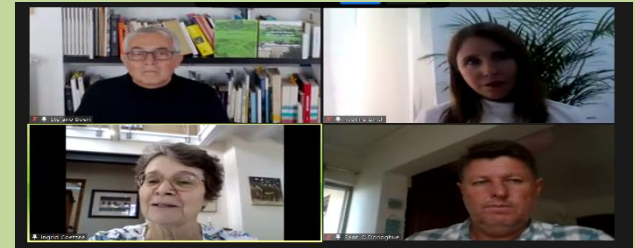
Resilient, Smart and Sustainable Cities: The power of Nature-based Solutions

- - Kongjian Yu (ecological urbanist and landscape architect) - the sponge cities model to tackle floods
- - Stefano Boeri (architect and urban planner) - the Vertical Forest a model for sustainable residential buildings
- - Debra Roberts (WG2 IPCC co-chair, head of the Sustainable and Resilient City Initiatives Unit in Durban, South Africa, leading expert in climate change issues in cities)
- - Likke Leonardsen (Head of Program for Resilient and Sustainable City Solutions, Copenhagen)

Additional topics:

-
- - example of constructed wetland for water treatment
- - example of urban agriculture/farming (Guido Santini, FAO)
- - example of ecosystem-based coastal erosion defense

L'evento ha **evidenziato i molteplici benefici dell'implementazione di soluzioni basate sulla natura (NbS)**



Let the numbers talk!



Workshop NBS (G20)

L'evento sugli aspetti di governance multilivello delle soluzioni basate sulla natura nelle città.

Per favorire le NBS è necessario il coordinamento e la cooperazione tra le città, i governi centrali e i partner di attuazione

La chiave per un'efficace governance multilivello

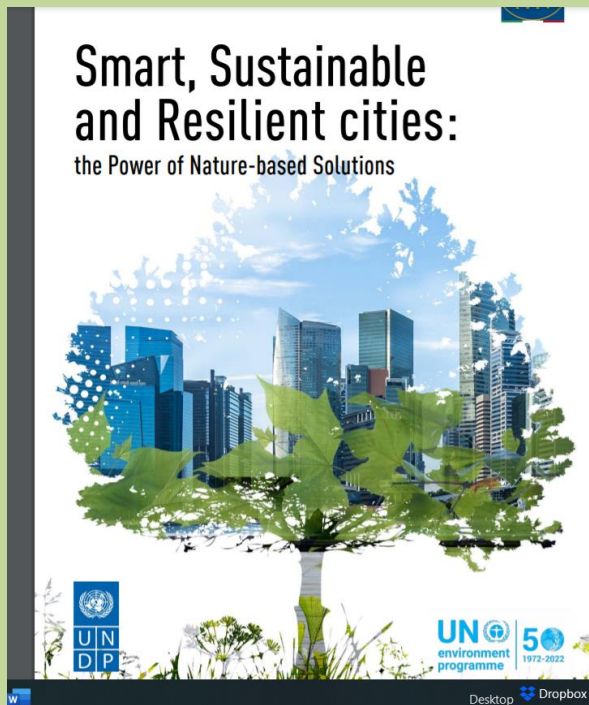
- Rimuovere le barriere all'implementazione
- Integrare le NBS nei processi di pianificazione e nelle strategie nazionali, così come i processi di governance e i modelli di business che coinvolgono le comunità e il settore privato





Documento NBS della Presidenza Italiana G20

- <https://www.g20.org/it/la-presidenza-italiana-del-g20/documenti/riunioni-ministeriali-documents.html>
- https://www.g20.org/wp-content/uploads/2021/07/G20_NbS-Cities_06.pdf





Documento NBS della Presidenza Italiana G20



Principi per la governance multilivello

Principio 1: Promuovere le NbS come elementi integranti della mitigazione del cambiamento climatico e delle strategie di adattamento

Principio 2: Quantificare i molteplici benefici della NbS e riconoscere tali benefici negli strumenti politici, come le linee guida di pianificazione, standard infrastrutturali e codici di costruzione.

Principio 3: Condividere l'esperienza con le NbS attraverso processi di apprendimento peer-to-peer dedicati

Principio 4: Progettare meccanismi che aiutino a superare il "problema della tasca sbagliata", attraverso ministeri e dipartimenti, attraverso il governo nazionale e locale, e che facciano da ponte tra benefici per la comunità e il settore privato investimenti

Principio 5: Le NbS sono progettate, implementate, gestite e monitorate in partenariato attraverso un processo che coinvolge pienamente e si basa sulla conoscenza locale in grado di generare benefici locali.



Cosa ha approvato il G20 Energia ambiente riguardo alle città

- Concordato il primo comunicato congiunto del G20 sull'energia e il clima, comprende 58 azioni di cui **20 dedicate alle città** con l'approvazione di un **piano d'azione** dedicato.
- Riconosciuto il ruolo cruciale delle città come catalizzatori dello sviluppo sostenibile, al dimezzamento delle emissioni globali e al sostegno della transizione verso società inclusive e prospere.
- Riconosciuta la necessità di ridurre la vulnerabilità aumentando la capacità di adattamento, dato che le città sono in prima linea nelle crisi del cambiamento climatico, dell'inquinamento e della perdita di biodiversità, giocando anche un ruolo importante sulla salute pubblica.



ANNEX IV SMART, RESILIENT AND SUSTAINABLE CITIES ACTION PLAN



ANNEXES
Joint G20 Energy-Climate Ministerial Communiqué

ANNEX IV

SMART, RESILIENT AND SUSTAINABLE CITIES ACTION PLAN

This Action Plan sets out general principles as a specific menu of options to help guide voluntary actions and measures for more inclusive and sustainable cities. These could be implemented taking into account differences in governance systems, development levels, financing access and financial flows, local context, national circumstances, needs and priorities, including geographical, social, environmental and climatic conditions, while ensuring meaningful participation of local communities, Indigenous peoples, women and youth, the private sector, as well as science and academia.

ENERGY

1. Improve policy integration across the national, regional and city levels to stimulate a sustainable energy transitions, acknowledging that responsibilities are often shared.
2. Enhanced collaboration with subnational actors in view of their role as key partners in the implementation of NDCs and long-term strategies through enhanced communication, coordination and cooperation across government levels and access to finance.
3. Support efforts to integrate a clean energy transitions and climate action objectives into existing and future city-level planning procedures and instruments.
4. Facilitate capacity building at all levels to develop skill sets needed to take advantage of the opportunities that digitalization and the clean energy transition can unlock, including access to international best practices, and peer to peer knowledge exchange.
5. Support the sharing of best practices also through voluntary sharing of available data.
6. Encourage energy efficiency measures at the local level also promoting public and private building renovations. Recognizing the guiding role of the public sector.
7. Promote citizens active involvement towards a sustainable consumption and production. In particular, by initiating or supporting measures to elicit or reinforce digitally enabled energy demand monitoring and management, sustainable

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Desktop

NATURE BASED SOLUTIONS OR ECOSYSTEM-BASED APPROACHES

10. Encourage the set-up of appropriate processes and steps, or refine existing ones, that bring together the different administrative levels, to scale up the integration of nature-based solutions or ecosystem-based approaches into urban and peri-urban infrastructure, planning and design, with the view of strengthening asset management capacity and practices to enhance adaptation and resilience.
11. Support incentives to facilitate the scaling up of nature-based solutions or ecosystem-based approaches, particularly, considering, where relevant:
 - a) further improvement of ways to strengthen the capacity of cities to act on and monitor their impacts and effectiveness;
 - b) identification of mechanisms that spur investment at the local level, particularly reinforcing a sustainable financial framework to facilitate cities' access to bilateral, multilateral and private sources of capital to implement them, and empower cities to review and reform their fiscal policies and budgets and to strengthen the provision of ecosystem services and investments across all sectors;
 - c) development or improvement of standards for sustainable infrastructure;
 - d) the need for social and environmental safeguards to create win-win solutions and prevent negative impacts on societies and ecosystems;
 - e) inclusion of criteria that promote infrastructure in public procurement processes.
12. Develop and design locally relevant nature-based solutions or ecosystem-based approaches that recognize and safeguard the value of biodiversity, ecosystem functions and services for urban communities and considering existing or past natural ecosystems and land- and seascapes including, but not limited to drainage patterns, habitat integrity and connectivity.

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ANNEXES
Joint G20 Energy-Climate Ministerial Communiqué

Further cross-border cooperation and collaboration in light of the boundary-spanning nature of interconnected ecosystems, particularly through city-region cooperation, including but not limited to watershed management and peri-urban farming, and planning of ecological corridors between and within cities.

14. Support efforts that harness the multiple benefits of nature-based solutions or ecosystem-based approaches in cities for achieving among others climate mitigation, ecosystem-based adaptation disaster risk reduction, flood prevention, combatting the urban heat island effect and overall resilience, as well as biodiversity, health, economic, employment and well-being objectives, by proactively deploying, conserving, protecting, restoring and valuing, inter alia and where relevant:
 - a) mangroves, dunes, seagrass beds and healthy reef systems that protect coastal cities from storm surges;
 - b) wetlands that provide habitat for biodiversity, increase water infiltration as well as raise groundwater levels and thereby reduce flood risks as well as urban heat island effects linked to climate change and the risk of droughts;
 - c) forested catchment areas that naturally filter, provide clean water and store carbon among other benefits;
 - d) parks, tree-lined streets, green roofs and building facades that mitigate the urban heat effect while reducing noise pollution, air pollution, and energy demand for cooling and provide habitat for animal and plant species, among



Piano d'azione sulle NBS

- **Incoraggiare processi che riuniscano i diversi livelli amministrativi. Migliorare la cooperazione e collaborazione in particolare attraverso la cooperazione tra città-regione, la gestione dei bacini idrografici, la pianificazione di corridoi ecologici tra le città e aree rurali**
- **Incentivare l'aumento delle NBS considerando: il monitoraggio, meccanismi di stimolo finanziario, lo sviluppo di standard, le salvaguardie ambientali**
- **Sviluppare NBS che riconoscano e salvaguardino la biodiversità, proteggendo, conservando, ripristinando gli ecosistemi e considerando l'integrità e la connettività degli habitat,**
- **Sostenere gli sforzi per ottenere benefici multipli e per quantificare e monitorare i molteplici benefici delle soluzioni basate sulla natura per la mitigazione e l'adattamento al clima, la conservazione della biodiversità, la salute umana e il benessere, tenendo in considerazione gli standard esistenti.**
- **Promuovere azioni per integrare ulteriormente le NBS negli spazi pubblici, negli edifici, negli spazi abbandonati, ect**
- **Riferire i progressi nell'implementazione di soluzioni basate sulla natura o approcci basati sugli ecosistemi come contributo al raggiungimento degli Obiettivi di Sviluppo Sostenibile e nell'ambito della UNFCCC, CBD e UNCCD**
- **Coinvolgere gli attori non statali, in particolare le comunità locali, le popolazioni indigene, le donne e i giovani, il settore privato, così come la scienza e il mondo accademico**
- **Promuovere la cooperazione internazionale per facilitare la diffusione di soluzioni basate sulla natura incoraggiando la condivisione delle conoscenze e delle migliori pratiche.**

Conclusioni

Ci serve una nuova normalità

Città concepite come ecosistemi,
progettate tenendo conto della natura

Costruire con infrastrutture verdi e
ibride, scegliendo adeguatamente il
«materiali vivente»

Esempi

CASE STUDY 02

Sponge cities in China

After decades of rapid urbanization, overexploitation and pollution, many urban areas in China face serious water shortages interspersed with periodic floods that are made worse by the climate crisis. Between 2007 and 2016, water-related issues led to estimated losses of more than \$36 billion every year.⁵⁸

In 2014 the Chinese government introduced the idea of 'sponge cities' to address urban flooding by increasing rainwater permeability in vulnerable cities. Sponge cities are a context-specific urban approach to integrated water resource management that use grey-green infrastructure like waterways and greenways, green roofs, porous design and water-saving approaches to control urban flooding, limit water pollution, recycle rainwater and reinstate degraded environments.⁵⁹

The government chose 30 cities as pilots. The goal is to retain as much water as possible during the wet season by limiting erosion and slowing run-off so that it is absorbed into the surrounding soils and drainage systems and available to meet needs when droughts hit.⁶⁰

While the initiative shows significant promise for the integration of NbS in urban design, a review of the pilot phase



of the initiative also pointed to several important lessons. First, differing water and land-use policies and property rights made regulation and implementation complicated. Second, the lack of comprehensive standards and national guidelines meant that some of the essential low-impact green infrastructures needed for sponge cities were not readily available for use. Third, the local climate proved critical. In some areas, for example, cold winter temperatures can kill off some of the more effective green infrastructures such as vegetation buffers. Lastly, financing the initiative proved challenging. Central government covered roughly 15 per cent to 20 per cent of the total costs but cities varied in their ability to harness public-private partnerships to make up the remaining amounts.⁶¹

CASE STUDY 01

Urban forests and nature-based solutions in Milan, Italy

The city of Milan in northern Italy has a population of nearly three million people spread over an area of more than 1,500 square kilometres.⁶² As an industrial and economic powerhouse, Milan also struggles with urban air pollution and a hot and humid climate in the summer, when temperatures in the city can be six degrees celsius higher than in surrounding areas.⁶³



The metropolitan area of Milan deploys nature-based solutions in a number of innovative ways. One such example is the expansion of urban greenery to cool the city. Heat mapping surveys have enabled the city to focus its tree-planting efforts in the hottest neighbourhoods, and the local administration has committed to plant three million trees by 2020.⁶⁴ In 2019 the city inaugurated the 'Tree Library', a large park developed in what was previously a concrete square in the business district and which is now home to hundreds of trees. It is estimated that the 30 per cent expansion in urban tree cover could absorb 18 million tons of carbon dioxide every year while reducing PM10 small particles by 3,000 tons over the next ten years, with significant benefits for the population's health.⁶⁵



A second example is a plan to renaturalize up to 41 old quarry sites, through the metropolitan area's 'quarry plan', a territorial planning tool that helps to locate the quarries, define the extraction volumes and develop mechanisms for environmental recovery after extraction has finished. A third is the provision of community gardens in municipally-owned areas upon request of groups of citizens.⁶⁶ A fourth is the integration of nature directly into new buildings. An example of this is the architect Stefano Boeri's Vertical Forest, which consists of two residential blocks built in 2014 that feature 800 trees, 15,000 plants and 4,500 shrubs that cover every balcony. The blocks provide an oasis of nature in one of the most densely packed areas of the city, attracting more than 20 species of birds and absorbing 30 metric tons of carbon dioxide each year.⁶⁷








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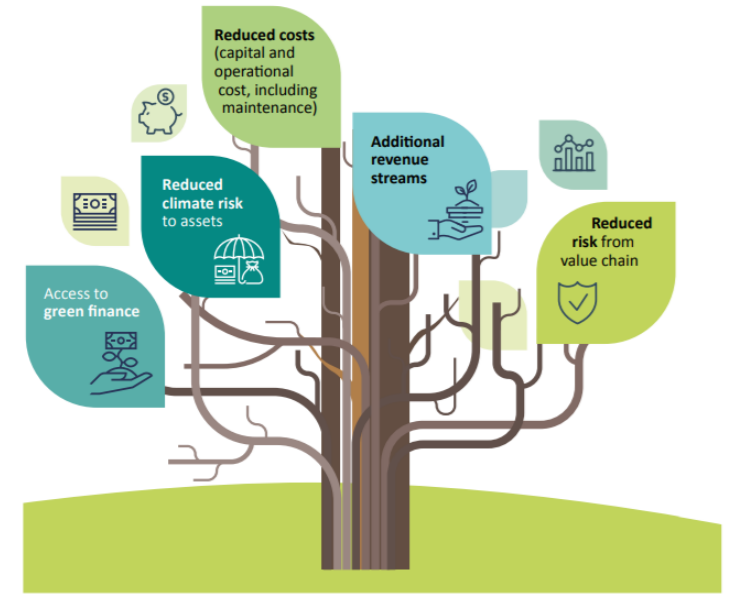
Table 1: Examples of commercially viable and self-sustaining Nature-based Solutions in cities

NbS types (non-exhaustive)	Lead private sector operator	Main revenue source	Avoided costs / indirect benefits	Government role / relevant policy instrument	Innovative finance sources
 Urban and peri-urban sustainable agriculture	Farmers and cooperatives	Sustainable food products, with a price premium for organic products	Pollution from pesticides	Land use rights and/or land leases; organic market promotion	Carbon finance, if mitigation benefits of climate smart agriculture practices are proven
 Water purification (catchment protection)	Water treatment company	Water-user fees	Savings on water treatment infrastructure / water quality and availability	Permits to operate; (possible) subsidies to support customer willingness to pay	Payments for ecosystem services ⁷²
 Peri-urban ecotourism & recreation (protected areas)	Tourism operators, peri-urban national parks and protected areas	Entrance fees in protected areas	Health benefits, biodiversity	Biodiversity conservation policy; concession mechanism	Endowment fund; carbon finance if mitigation benefits are proven
 Urban ecotourism	Hotels	Hotel nights	Savings from cost-efficient green infrastructure / biodiversity and health benefits	Standards; regulate the sustainable finance market	Corporate green bonds (hotel group)
 Green housing	Real estate promoters	Real estate sales	Savings from cost-efficient green infrastructures / premiums from biodiversity and health benefits	Standards; regulate the sustainable finance market	Land capture value; ⁷³ corporate green bonds (real estate group)



NbS business benefits
Under the right conditions, implementing NbS can

Figure 2: Nature means business



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