Nature-based Solutions

#1

Defining and Understanding NbS

Some facts...

$44 trillion of economic value generation, half of World's GDP is moderately or highly dependent on nature

According to IPBES around 1 million species are under the threat of extinction.

The UN estimated that 40% of land is now degraded. Freshwater is becoming more scarce, 60% of rivers in Europe defined unhealthy

Defining Nature-based Solutions (NbS)

According to the International Union for the Conservation of Nature (IUCN) NbS are:

Actions to protect, sustainably manage, and restore natural and modified ecosystems

Address societal challenges effectively and adaptively

Actions that benefiting people and nature simultaneously

Frequent expressions used when talking of NbS :

Biodiversity and Ecosystems

e.g., forests, wetlands

Restore and Manage

e.g., mangrove restoration, reforestation

Mitigation, Adaptation and Resilience

e.g., carbon capture, flood recovery

Societal Issues

e.g., public health benefits

Societal Issues that NbS could improve

- **Climate change mitigation & adaptation**
- **Disaster Risk Reduction**
- **Public Health**
- **Water and Food Security**

Woodberry Wetlands/©Jim Johnston

NbS linked to forest, wetlands and agriculture could sequestrate 1/3 of GHG emissions

Wetlands, forests and coastal systems act as buffers that reduce exposure to natural hazards

NbS can improve water and food quality, reduce zoonotic diseases, and bring physical and mental health benefits

What about **implementing NbS in Urban settings?**

Cities have 57% of global population in urban areas

Cities consume 75% of natural resources

Bee Path/©City of Ljubljana

Some types of Urban NbS:

Green roofs, parks and urban forests, blue infraestructure

And some actual barriers for the implementation of Urban NbS:

functionality, planning, awareness

Keep following our #NatureBasedSolutions Campaign to see in depth their **benefits for the environment, health, and the role of youth** in implementing them!

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Sources:

WEF
https://www.weforum.org/press/2020/01/half-of-world-s-gdp-moderately-or-highly-dependent-on-nature-says-new-report/

UN, IPBES
https://www.un.org/sustainabledevelopment/blog/2019/05/nature-decline-unprecedented-report/

The Guardian
https://www.theguardian.com/environment/2022/apr/27/united-nations-40-per-cent-planet-land-degraded

WWF
https://wwf.panda.org/discover/our_focus/freshwater_practice/freshwater_inititiaves/living_european_rivers_initiative/
https://wwf.panda.org/discover/our_focus/climate_and_energy_practice/what_we_do/nature_based_solutions_for_climate/

IUCN
https://www.iucn.org/our-work/nature-based-solutions
https://www.iucn.org/our-work/topic/nature-based-solutions-cities

European Commission
https://research-and-innovation.ec.europa.eu/research-area/environment/nature-based-solutions_en

Bona, S., et Al. (2023)
Nature-Based Solutions in Urban Areas: A European Analysis. Appl. Sci. 13(1), 168. https://doi.org/10.3390/app13010168

Nelson, D., Bledsoe, B., et Al. (2020)
Challenges to realizing the potential of nature-based solutions. Current Opinion in Environmental Sustainability. 45, 49–55. https://doi.org/10.1016/j.cosust.2020.09.001

Nature-based Solutions

#2

What are the benefits for environment & health?

Climate change mitigation

A major benefit of NbS is the ability of ecosystems to sequester carbon

NbS through restoration, conservation and improved land-management could save 10 gigatons of carbon per year

Climate change adaptation

Nature-based solutions also play a role in adaptation to the environmental changes and natural disasters caused by climate change

For example:

Mangroves prevent a predicted 15 million people from exposure to flooding per year and save $65 billion in damage

Biodiversity

Restoring and conserving ecosystems for NbS also enables biodiversity to increase

IUCN Global Standard for Nature-based Solutions (2020) "Criterion 3: NbS result in a net gain to biodiversity and ecosystem integrity"

88% of NbS which had a positive impact for climate change adaptation also had a positive impact for ecosystem health and increased species richness by 67% on average

NbS for public health

1

Clean and safe drinking water

NbS increases water availability and quality, impacting water security

2

Reduced urban heat stress

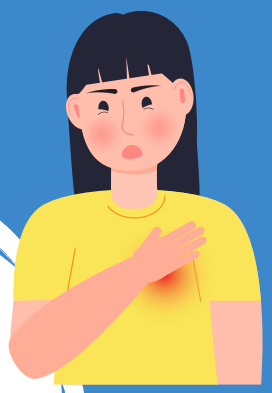
Trees in urban areas lead to cooler environments

3

Reduced incidence of zoonotic diseases (COVID-19)

Zoonotic diseases emerge from degraded ecosystems, so restoration could prevent spread to humans

4



Reduced cardiovascular disease

NbS in urban areas has also been implicated in reduced mortality of the population from cardiovascular disease

Mental health

Improved wellbeing is associated with access to public green spaces and urban trees

Time in nature has been demonstrated to be an effective treatment to reduce symptoms of anxiety and depression

In an urban setting, NbS has also been associated with a moderate reduction in the incidence of mental disorders

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Sources:

Jenkins, S., Millar, R. J., Leach, N., & Allen, M. R. (2018). Framing climate goals in terms of cumulative CO2-forcing-equivalent emissions. Geophysical Research Letters, 45(6), 2795-2804.

Girardin, C. A., Jenkins, S., Seddon, N., Allen, M., Lewis, S. L., Wheeler, C. E., ... & Malhi, Y. (2021). Nature-based solutions can help cool the planet—if we act now. Nature, 593(7858), 191-194.

Menéndez, P., Losada, I.J., Torres-Ortega, S. et al. (2020) The Global Flood Protection Benefits of Mangroves. Sci Rep 10, 4404

Andrade, A., Cohen-Shacham, E., Dalton, J., Edwards, S., Hessenberger, D., Maginnis, S., ... & Vasseur, L. (2020). IUCN Global Standard for Nature-Based Solutions: a user-friendly framework for the verification, design and scaling up of NbS. IUCN: Gland, Switzerland.

Key, I., Smith, A., Turner, B., Chausson, A., Girardin, C., Macgillivray, M., & Seddon, N. (2022). Biodiversity outcomes of nature-based solutions for climate change adaptation: characterising the evidence base. Frontiers in Environmental Science, 10.

UNDP Nature-based Solutions report: https://www.undp.org/publications/nature-based-solutions-water

Morand, S., & Lajaunie, C. (2021). Biodiversity and COVID-19: A report and a long road ahead to avoid another pandemic. One Earth, 4(7), 920-923.

Van den Bosch, M., & Sang, Å. O. (2017). Urban natural environments as nature-based solutions for improved public health–A systematic review of reviews. Environmental research, 158, 373-384.

Astell-Burt, T., Hipp, J. A., Gatersleben, B., Adlakha, D., Marselle, M., Olcoń, K., ... & Feng, X. (2023). Need and Interest in Nature Prescriptions to Protect Cardiovascular and Mental Health: A Nationally-Representative Study With Insights for Future Randomised Trials. Heart, Lung and Circulation.

Nature-based Solutions

#3

Youth and NbS

Youth and Nature-based Solutions (NbS)

As the world's next leaders, youth should...

- Be aware of environmental issues and the climate emergency
- Have the right to be involved in environmental solutions
- Foster a positive impact on the environment and communities

Youth Network Initiatives

The Global Youth Biodiversity Network, YOUNGO, and Youth4Nature

Inclusive Global Youth Position Statement on Nature-based Solutions

“Youth are already taking action for biodiversity, nature and climate on the ground in their communities and should be meaningfully supported to continue and scale up this work, rather than tokenized (or“youthwashed”) for top-down, exclusive activities and engagements.”

www.nbsyouthposition.org/statement

YOUNGO
OFFICIAL YOUTH CONSTITUENCY OF THE UNFCCC

YOUTH4 NATURE

Global Youth Biodiversity Network

Engaging the Next Generation

Ways to get youth involved in NbS projects

Policymakers integrating the youth role into NbS strategies/actions

Mandatory groups of local young people to participate in the development of the projects

Include youth, particularly women, in decision-making processes on NbS

Case study : INUKA Project

This project launched on 20 March 2023 in Nairobi for 15 months. It seeks to take advantage of experiential learning to deliver training on NbS, best practices, youth leadership, storytelling and scale-up solutions across five key landscapes in Kenya and other African countries

Case study : INUKA

Topics of the project:

Carbon offsetting; flooding mitigation; irrigatation of fields; biodiversity protection; environmental education...

INUKA's main goals:

- Biodiversity and NbS best practice
- Sustainable Livelihoods and youth Leadership
- Community building and storytelling

INUKA's meaning:

"INUKA" is a Swahili word for "rise up"

Get to know more about the project:
www.youth4nature.org/blog/inuka-is-launching

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Sources:

Statement
https://static1.squarespace.com/static/60d345a74ed9f630745b8646/t/61868053f73d0949acb7dd1e/1636204632840/Nature-Based+Solutions-Position+2021 Nov+C.pdf

Inukaproject
https://www.youth4nature.org/blog/inuka-is-launching

Nature based solutions online class : unit 4 inclusion of youth
https://sdgacademylibrary.mediaspace.kaltura.com/media/Inclusive+actionA+Importance+of+youth%2C+communities+and+indigenous+people+for+Nature-based+Solutions/1_8qes2ha8/202650223

The Next leap on climate : creating and enabling environment for youth led-action
https://energy-base.org/news/the-next-leap-on-climate-creating-an-enabling-environment-for-youth-led-action/

Nature-based Solutions

#4

Advocacy & partnerships

Why is advocacy important?

In response to a continuously changing world it is essential to raise awareness on issues and to influence change

Advocating on NbS can have a huge impact on EU policies regarding climate change mitigation and adaptation. Raising awareness on NbS will increase knowledge and sensitivity of citizens towards day to day issues, like air pollution or environmental hazards

International Best Practices

The Regenerative Agriculture's case

Regenerative agriculture is a key component for solving the global climate crisis and providing land stewards with rich soil and clean water

RAF (Regenerative Agriculture Foundation) is an intermediary founder created in 2016 which collaborates with foundations, investors, nonprofits, community leaders, and land stewards

Main objectives :

- Advance regenerative agriculture
- Develop and promote climate solutions
- Protect freshwater and oceans
- Support thriving rural communities, and sustain diverse human and ecological life

WWF: We Love Cities

Over **half the world's population now live in cities**, and they generate over 70% of our climate footprint. Through better transport, green buildings, harnessing the power of nature, wasting less and loving more, **cities can lead the way to a climate-friendly future**

WE LOVE CITIES

JOIN THE GLOBAL CELEBRATION OF THE MOST LOVABLE SUSTAINABLE CITIES

Two municipalities won the campaign, do you want to know which ones? **Check out the next slides!**

WWF: We Love Cities

Lund has been named the best climate city in Sweden and the best one in the world by the the World Wide Fund for Nature (WWF)

Among all the contenders, Lund has made the most significant contribution to the competition, according to the panel, and is distinguished by ambitious and explicit climate goals, political leadership, and a broad and transparent work program

WWF: We Love Cities

There's more!
By restricting parking and offering alternatives, the city of Lund hopes more residents will choose car–free living, which the municipality estimates can save 13 kilotons of CO2 equivalent per year

Lund pioneered the invention of an ingenious 'electric road' so that vehicles such as buses and trucks can continuously recharge while in motion

Some initiatives and their amazing results

A big switch from natural gas to biogas and residual heat – and biomass –fueled district heating is expected to save 77 kilo tons of CO2 equivalent annually

What about the other winner?

WWF: We Love Cities

The Bogota' Municipality was elected alongside Lund

The Bogota' Municipality launched the "Bogotá Reverdece" Land Use Plan, which prioritises bicycles, pedestrians, proximity, and clean mass transportation with five subway lines, two regional trains, seven cable car lines, and a zero-emission bus system to reduce the carbon footprint and contribute to meeting mitigation goals

Additionally, it protects and expands the Main Ecological Structure by 30%, raised the level of protection of wetlands, and increases their area by 20%

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Sources:

https://regenerativeagriculturefoundation.org

https://welovecities.org

Nature-based Solutions

#5

NbS controversies

Understanding greenwashing in NbS

- Dismissing the urgent need for systemic change through decarbonization
- Distracting attention from harmful local impacts of fossil fuel extraction

Greenwashing case n°1 : VERRA

Verra

World's leading carbon standard for the voluntary offsets market

The investigation

94% of rainforest offset credits don't represent genuine emissions reductions

The method

Companies used credits to make false claims of reducing emissions

(Source: The Guardian)

Greenwashing case n°2 : SHELL

© Pixabay

Shell

The multinational oil and gas company has been accused of greenwashing

The strategy

Shell plans significant investments in 'nature-based offsets' and renewable energy

The reality

- **Carbon offsetting does not contribute to meeting short-term climate targets (SBTi*)**
- **Shell is responsible for emissions that far outweigh those it seeks to offset**
- **The budget for exploring new fossil fuels is much greater than for renewables and NbS projects**

Implementation issues with NbS

NbS are sometimes implemented through **top-down governance**

Many NbS projects **don't propose empowering local communities** to face climate impacts

Plantations and protected areas are sometimes established within **Indigenous Peoples' territories** without their consent

Private companies may use NbS and nature **to make a profit**

Threats to biodiversity

Misguided measures to offset carbon:

- Afforestation
- Non–native species
- Degradation of native vegetation
- Monocultures
- Plantations for short–lived products
- Plantations that store less carbon

Key aspects when considering NbS

They are not an alternative to drastic emissions cuts (UNEA resolution)

Protecting intact ecosystems has the highest potential

Local social outcomes are key to ensure long-lasting NbS

Key aspects for achieving successful NbS

Cooperation within and between governments and among stakeholders

Secure and sustainable flows of finance to the communities and projects that need it most

Boost the visibility of projects from underrepresented regions

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Sources:

Melanidis, Marina Stavroula, and Shannon Hagerman. "Competing Narratives of Nature-Based Solutions: Leveraging the Power of Nature or Dangerous Distraction?" Environmental Science & Policy 132 (June 1, 2022): 273-81.

Li, Mei, Gregory Trencher, and Jusen Asuka. "The Clean Energy Claims of BP, Chevron, ExxonMobil and Shell: A Mismatch between Discourse, Actions and Investments." PLOS ONE 17, no. 2 (February 16, 2022): e0263596.

"Revealed: more than 90% of rainforest carbon offsets by biggest certifier are worthless, analysis shows" The Guardian (January 18, 2023).

"Greenwashing Files: Shell" ClientEarth (www.clientearth.org/projects/the-greenwashing-files/shell/).

"Guest Post: How Can Nature-Based Solutions Help Cities Achieve Their Climate Goals?" Carbon Brief (January 30, 2023.)

Girardin, Cécile A. J., Stuart Jenkins, Nathalie Seddon, Myles Allen, Simon L. Lewis, Charlotte E. Wheeler, Bronson W. Griscom, and Yadvinder Malhi. "Nature-Based Solutions Can Help Cool the Planet – If We Act Now." Nature 593, no. 7858 (May 2021): 191-94.

Cook-Patton, S.C., Drever, C.R., Griscom, B.W. et al. "Protect, manage and then restore lands for climate mitigation" Nature Climate Change 11, 1027-1034 (2021).

Fleischman, Forrest, Shishir Basant, Ashwini Chhatre, Eric A Coleman, Harry W Fischer, Divya Gupta, Burak Güneralp, et al. "Pitfalls of Tree Planting Show Why We Need People-Centered Natural Climate Solutions." BioScience 70, no. 11 (November 17, 2020): 947-50.

Nature-based Solutions

#6

International NbS
case studies

Estonia: Wetland restoration

By leading the way in restoring wetland ecosystems, Estonia is **transforming its bogs from CO_2 sources to sinks**

This can provide **co-benefits** such as:

- Greater biodiversity
- Purified water
- Increased tourism

Degraded peatlands are **sources of greenhouse gases** (including methane and CO_2)

France: Agroforestry

1/2 Million

Hectares of agroforestry expected in France

The scheme adopted in Montpellier (Southern France), implemented for 20 years, proposes a combination of walnut trees and wheat cultivation

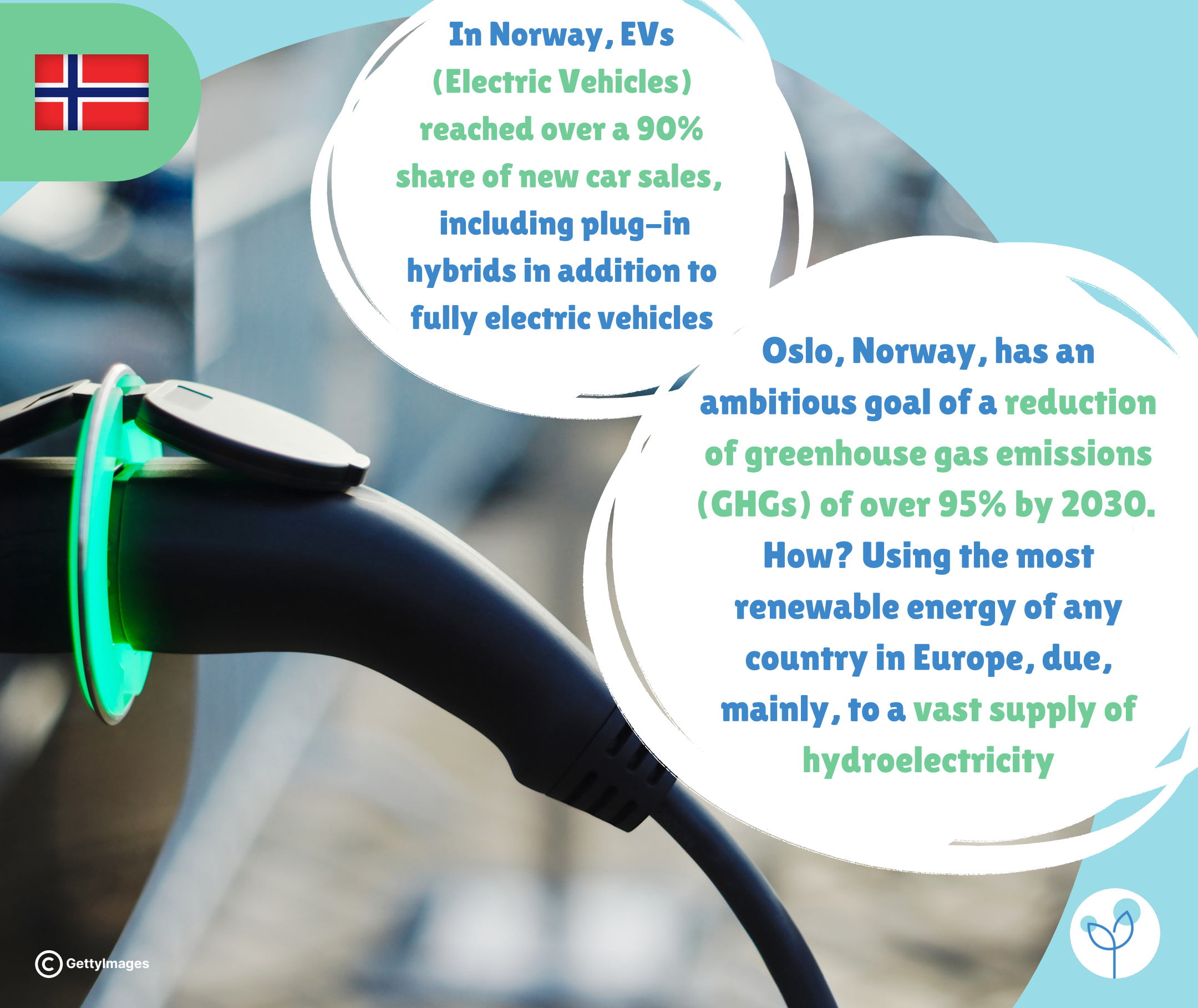
Agriculture is **both a cause and a victim of climate change** (higher temperature and droughts) so appropriate adaptation measures are crucial

Agroforestry is the **combination of trees and crops cultivation**, a more resilient system (monocultures are deemed to be more vulnerable)

Main benefits:

- A 40% increase in productivity compared to traditional cultivation (INRAE)
- Trees provide shelter for crops
- Increased biodiversity and enhanced pollination
- Farmers can diversify their products and increase their income

Norway: Renewable Energy



In Norway, EVs (Electric Vehicles) reached over a 90% share of new car sales, including plug-in hybrids in addition to fully electric vehicles

Oslo, Norway, has an ambitious goal of a reduction of greenhouse gas emissions (GHGs) of over 95% by 2030. How? Using the most renewable energy of any country in Europe, due, mainly, to a vast supply of hydroelectricity

Singapore: Urban Parks and Green Spaces

Design with biodiversity in mind:

When designing urban parks and green spaces, Singapore prioritises the conservation of biodiversity. The country has a national biodiversity strategy that guides the design and management of green spaces, with a focus on preserving and enhancing natural habitats for local flora and fauna

Key Measures

- Using native plants
- Emphasizing accessibility and inclusivity
- Promoting active recreation and mental health
- Fostering community involvement

USA: Permeable pavement

Before

After

Permeable pavements are natural drainage systems that have great benefits:

- **Avoid flooding and reduce water consumption**
- **Reduce CO_2 emissions**
- **Reduce temperature, avoid heatwaves**
- **Reintroduce nature in the city**
- **Preserve biodiversity**
- **Provide mental health benefits**

Switzerland : Green Roof/Wall Systems

Systems intentionally covered with vegetation on a growing medium

Also called "contained" green spaces

Some benefits are:

Energy Efficiency and Water Management, Improved Biodiversity, Improved Air Quality and Carbon Capture

Basel's Green Roofs

Since 2010, green roofs are compulsory on all flat-roofs

5.71 m2/capita (2019) = largest area of green roofs per capita globally

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Sources:

Green Roofs — Green Roofs for Healthy Cities. https://greenroofs.org/about-green-roofs

Green Walls — Green Roofs for Healthy Cities. https://greenroofs.org/about-green-walls

Medl, A., Stangl, R., & Florineth, F. (2017). Vertical greening systems – A review on recent technologies and research advancement. *Building and Environment*, *125*, 227–239. https://doi.org/10.1016/j.buildenv.2017.08.054

Green roofs in Basel, Switzerland: *combining mitigation and adaptation measures* — Climate-ADAPT. https://climate-adapt.eea.europa.eu/en/metadata/case-studies/green-roofs-in-basel-switzerland-combining-mitigation-and-adaptation-measures-1

https://climate-adapt.eea.europa.eu/en/metadata/case-studies/agroforestry-agriculture-of-the-future-the-case-of-montpellier/#source

https://www.nparks.gov.sg/biodiversity/our-national-plan-for-conservation/national-biodiversity-strategy-and-action-plan

https://www.nparks.gov.sg/biodiversity/our-national-plan-for-conservation/national-biodiversity-strategy-and-action-plan

https://www.greencitytimes.com/climate-goals-is-oslo-leading-the-way/
https://www.mi-forums.com/green-oslo
https://www.greenvisits.no/product/the-norwegian-electric-vehicle-success/

https://www.seattle.gov/documents/Departments/SDCI/Vault/GreenFactor/GFSvRPresentationRainGardens.pdf

https://www.epa.gov/soakuptherain/soak-rain-permeable-pavement