

# How can governments incorporate nature-based solutions in their infrastructure systems?

## ICE Presidential Roundtable summary

February 2024

### Background

Governments globally are facing challenges in decarbonising their economies and increasing resilience to the impacts of climate change.

Traditional hard infrastructure solutions are limited in addressing this effectively, not least as human activity puts the world's ecosystems under immense pressure. Habitat loss is happening at an unprecedented rate, and almost a third of this damage is due to construction.

In 2022, in a landmark decision, the United Nations Environment Assembly formally recognised nature-based solutions. It defined them as “actions to protect, conserve, restore, sustainably use and manage natural or modified terrestrial, freshwater, coastal and marine ecosystems, which address social, economic and environmental challenges effectively and adaptively, while simultaneously providing human well-being, ecosystem services and resilience and biodiversity benefits”.

This was the first time that the concept was discussed and agreed by governments in a multilateral forum.

Nature-based solutions, if implemented well, have the potential to provide policymakers with solutions that achieve better outcomes for people and the planet.

However, while nature-based solutions have the potential to offer long-term benefits for people, the environment, and the economy, a range of barriers have limited their scale.

The ICE convened a roundtable of experts, chaired by ICE President Anusha Shah, to discuss how governments can incorporate nature-based solutions into their infrastructure systems.

Nature-based and nature-positive solutions are being implemented globally, but in isolated pockets. They have not yet become part of the systemic approach to infrastructure planning.

This is due to several reasons, including:

- A lack of understanding from policymakers and the public of the benefits and outcomes of nature-based solutions.
- A patchy, location-specific evidence base that breeds low confidence from key actors such as regulators.
- A siloed approach to delivering infrastructure and infrastructure services, resulting in conflicting approaches to nature-based solutions and no clear direction on how to best integrate them into strategic infrastructure planning and prioritisation.

## What are the benefits of nature-based solutions?

Nature-based solutions are actions or measures inspired by, supported by, or copied from nature.

They may involve protecting, managing, or enhancing existing natural solutions and creating engineering solutions that mimic natural processes.

If implemented carefully, nature-based solutions can provide numerous benefits across the infrastructure system:

- Nature-based solutions can deliver infrastructure services in their own right. For example, they can provide mental and physical health benefits, which subsequently takes pressure off health services.
- Nature-based solutions can complement existing infrastructure services, easing maintenance requirements.
- Wetlands and floodplain restoration can mitigate climate change impacts, such as protecting communities, nature, and existing infrastructure assets from flooding.
- A growing body of evidence demonstrates the benefits of nature-based solutions to the workforce, boosting health and productivity, and delivering economic benefits.
- Finally, nature-based solutions can provide multiple benefits through carbon sequestration, improving habitat biodiversity, woodland cover, and park cover. These latter benefits are particularly important in enhancing heat resilience in cities.

As a result, the cost-benefit ratios for nature-based solutions can be favourable over a long period compared to traditional hard infrastructure solutions.

Three sectors in particular – culture/recreation, water, and health – stand to benefit the most from nature-based solutions, but all sectors can benefit from the protection they offer existing built assets.

While the potential exists, however, nature-based solutions have not been developed or delivered at scale.

## Building an evidence base and shouting loud about the benefits

Attendees agreed that it can be more complex to calculate the cost and benefit of nature-based solutions compared to hard infrastructure.

The infrastructure profession is used to delivering large capital projects. Hard infrastructure solutions provide certainty in cost modelling as they have been planned, designed, and built frequently, with clear benchmarks. This is less clear for nature-based solutions. Therefore, the answer lies in building an evidence base and promoting exemplary projects.

This involves reinforcing the long-term cost benefit of nature-based solutions: they have lower maintenance costs compared to hard solutions.

Attendees outlined that regulators are allowing some pilot nature-based projects to proceed, but they have not yet been built into infrastructure planning mechanisms as 'business as usual'. Confidence among regulators and policymakers for nature-based solutions to be rolled out widely remains low, so pilot projects need to capture and quantify the full array of outcomes to help inform future proposals.

The discussion turned to blending the hard evidence of benefits with the slightly softer. The exact impact of nature-based solutions will be known only after they have been tried and monitored in the long term, though evidence already indicates a positive impact.

## Perception issues

From a public perspective, it is often easier to attribute the absence of flooding to hard structures than to nature-based solutions.

Communities perceive hard infrastructure solutions as ‘tried and tested’, providing a tangible form of protection.

The solution here is working with communities not only to better inform them of the benefits of nature-based solutions, including natural flood protection, but also to co-create solutions that work for people. Some of these solutions may take a hybrid form, combining traditional infrastructure solutions with nature-based ones.

Any community-focused approach must genuinely engage, using compelling narratives and hard data to lay the foundation for co-creating forward-looking infrastructure provision.

Where this approach has been taken, for example, in the [Kersal Wetlands in Salford](#), communities have been positive about the impact. This project created a new outdoor public space and improved biodiversity while providing a natural flood defence, protecting over 2,000 homes.

When communicating with policymakers, traditional engineering solutions are easy to explain. There is a wealth of evidence on their benefits, impacts, and costs built up over decades. Conversely, explaining a nature-based solution, such as a whole-catchment approach to river management and flooding, is more complicated.

Limited evidence of how nature-based solutions have been integrated successfully into strategic infrastructure planning processes has helped perpetuate the notion amongst policymakers that building new assets is the only way forward. Overcoming this resistance to change through encouraging a shift in mindset is a significant cultural challenge.

Attendees outlined that the HM Treasury Green Book provides the right tools for assessing nature-based solutions. Still, the difficulty comes in convincing civil servants to change their mentality and providing them with the skills to best apply the Green Book principles to achieve nature- and people-positive outcomes.

## Sweeping away the siloes

Attendees spoke of the huge governance challenges in implementing nature-based solutions, including how different government departments are responsible for different processes and systems. Nature itself does not adhere to human boundaries; only with collaboration and systems thinking across central and local government can true change be achieved.

Part O of the Building Regulations in England, for example, does not accept green infrastructure such as living walls and green roofs as a way to mitigate overheating in homes, meaning there is no incentive for developers to consider it in their housing projects.

And while some local authorities are leading the way with exemplary nature-based projects, others are building homes on floodplains.

In part, this is because planning departments vary fundamentally across local authorities, so there is a need to support planning officers in implementing nature-based solutions.

Attendees discussed the need for something totemic to take the concept of nature-based solutions to a systems-wide level instead of being considered at an individual project level. This could build on the UK Government’s [Nature Recovery Network](#) concept, developing a compelling values-based narrative that resonates with the public.

Fundamentally, the biggest barrier to implementing nature-based solutions is skills and education. This is across the piece, from universities and educators to clients, regulators, engineers, other practitioners, and the public.

Change will only start to come about when all these parties are informed and pulling in the same direction.

### Questions to take away

- What tools do policymakers need to enable them to more accurately evaluate the value and impact of nature-based solutions, particularly when compared to conventional infrastructure interventions?
- How can a nature-based approach best be brought into the full lifecycle of infrastructure, from design to delivery, maintenance, and decommissioning?
- Which global examples provide insight into how nature-based solutions have successfully delivered short- and long-term benefits in infrastructure systems, and how could these be upscaled or used elsewhere?

### Further reading:

ICE strategy session: [Systems thinking in action – a nature-based approach](#) (2023)

ICE blog: [Nature-based solutions: respite for our elderly during heatwaves and beyond](#) (2023)

ICE Presidential Roundtable summary: [Could the UK benefit from a water strategy?](#) (2023)