



# Nature: The next frontier for real asset technology

By Rebecca Jinks, Director, ESG & Sustainability, Taronga Ventures

In 2015, when Taronga Ventures first identified the convergence of real assets and technology, we encountered many sceptics. At the time, the real estate sector was considered to be slow moving with only the mining sector being less open to innovation (McKinsey). By 2018 we started to see an acceleration of interest, especially in the application of construction tech and in areas such as customer engagement and experience. As a global pandemic impacted all sectors there was a universal acceptance that we needed our assets to be more flexible with a greater focus on decarbonisation. As a result, we have seen the proliferation of technologies and investments to address environmental, social and governance shortfalls and challenges for our industry.

Over the past year there has been a rise of interest in nature and biodiversity, and the question we are now asking is whether biodiversity and nature are the next

frontier for Real Asset technology - as climate tech has been in previous years.

According to the Intergovernmental Panel on Climate Change (IPCC), managed and natural ecosystems absorbed around one-third of anthropogenic CO<sub>2</sub> emissions from 2010 to 2019. Actions to restore and preserve nature could be as important if not more important than climate change mitigation efforts.

In 2023, with the final release of the sixth assessment report, the IPCC Chair noted:

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**“This Synthesis Report underscores the urgency of taking more ambitious action and shows that, if we act now, we can still secure a liveable sustainable future for all.”**

Hoesung Lee, Chair, IPCC

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# Earth Observation Indicators

Satellite-derived insights about the natural and built environment

Nature plays a critical role in providing systems and services that our community relies on, including food, clean air, energy, medicines and many other resources. The assets that underpin our ecosystems are comprised of natural resources (i.e. land, water) and biodiversity (being a variety of plant and animal life) are often referred to as ‘natural capital’ due to the economic value they generate for societies. Nature, natural capital and biodiversity are thus critical to the ongoing prosperity of humans and our economy.

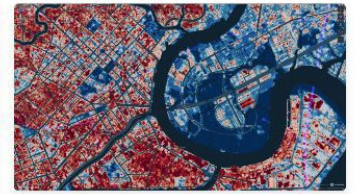
This is why the UN Biodiversity Conference (COP15) met in December 2022 and established a new global framework that will work towards halting the loss of biodiversity. It is anticipated that for the real estate industry, biodiversity and nature will become leading topics to be addressed in 2023 and beyond.

It is commonly assumed that cities are devoid of flora and fauna. The reality is that many cities should have rich biodiversity, regardless of geographic location and climate. Some are even located in biodiversity hotspots, while others are important corridors for migratory species. The ecosystem services that urban environments provide to the local area are innumerable and often undervalued and thus, often destroyed through development and operational activities.

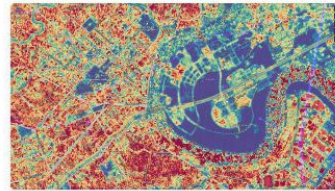
This article will explore the importance of considering and addressing nature and biodiversity within the real estate and infrastructure industry, and provide tangible actions to address. We explore early applications of nature focused solutions through case studies in partnership with both **CBRE**, a leader in commercial real estate services and investments, and **Ivanhoé Cambridge**, a leading investor in real estate properties, projects and companies.



**BARREN SOIL**  
Indicates areas that can absorb water or not



**SOIL MOISTURE**  
Useful to identify the lack or excess of moisture in the soil.



**SOIL SALINITY**  
Indicates areas that are challenging to grow food and vegetation



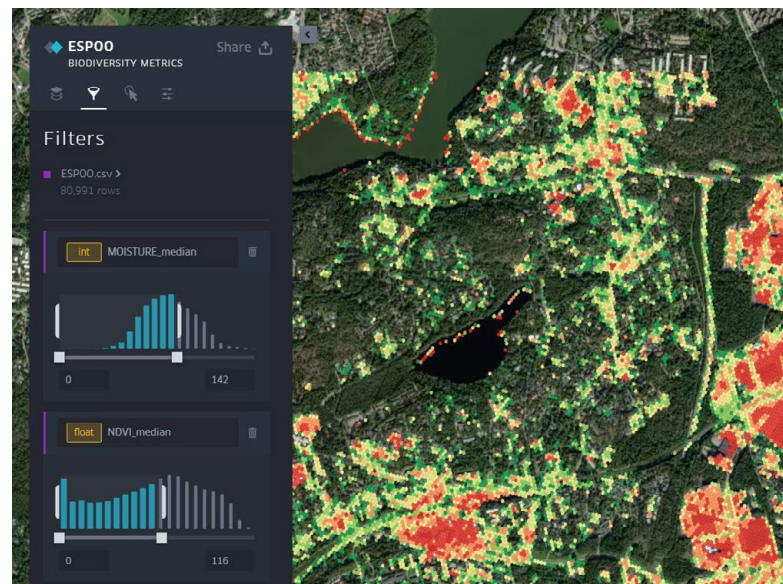
**TERRAIN ELEVATION**  
The shape of the terrain underneath buildings and trees.



**VEGETATION DENSITY**  
Indicates the capacity to absorb water and purify the air



**VEGETATION HEALTH**  
Visualizes the extent and health of green infrastructure.



Optimal Cities uses Earth observation and geospatial intelligence to analyse and diagnose accessibility, environmental and economic conditions and opportunities.

**“Nature and natural capital are of increasing importance to CBRE and to our clients. There is so much dependence on natural capital in the real estate industry and therefore we are moving towards being nature positive. Building, preserving and managing natural capital and**

**biodiversity will improve the productivity and sustainability of our assets, support economic prosperity for local communities and build resilience to climate change impacts.”**

Su-Fern Tan, Head of ESG - CBRE Pacific

A report by the World Economic Forum found that more than half the world's GDP, equivalent to \$44 trillion<sup>1</sup> is dependent on nature; highlighting the economic risks of unchecked biodiversity loss. Without implementing greater control and restoration of biodiversity, many of these ecosystem assets will become scarce and therefore more expensive, harder to access, or disappear altogether. Without natural systems, without plants, crops and pollinators, we have no sources of nutrition, our water goes uncleaned, illness runs rampant and society as we know it is no longer viable.

This is why biodiversity, a concept that has been generally nascent in the ESG community, is now rising to prominence and is being considered and addressed by responsible real estate groups.

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**“Ivanhoé Cambridge is looking to continue to incorporate nature and biodiversity considerations into how we manage our real estate portfolios. Nature will help us tackle urban ESG challenges such as water filtration, local food supply, clean air, and wellness. We believe that natural capital management in real estate will soon be considered as important as climate change mitigation.”**

Stéphane Villemain, Head of Sustainable Investment – Ivanhoé Cambridge

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## How is regulation driving nature-based decision making?

A common challenge many of our partners face is how to balance the regulatory demands for project approval with a real consideration of nature and biodiversity that occur during developments or green ratings.

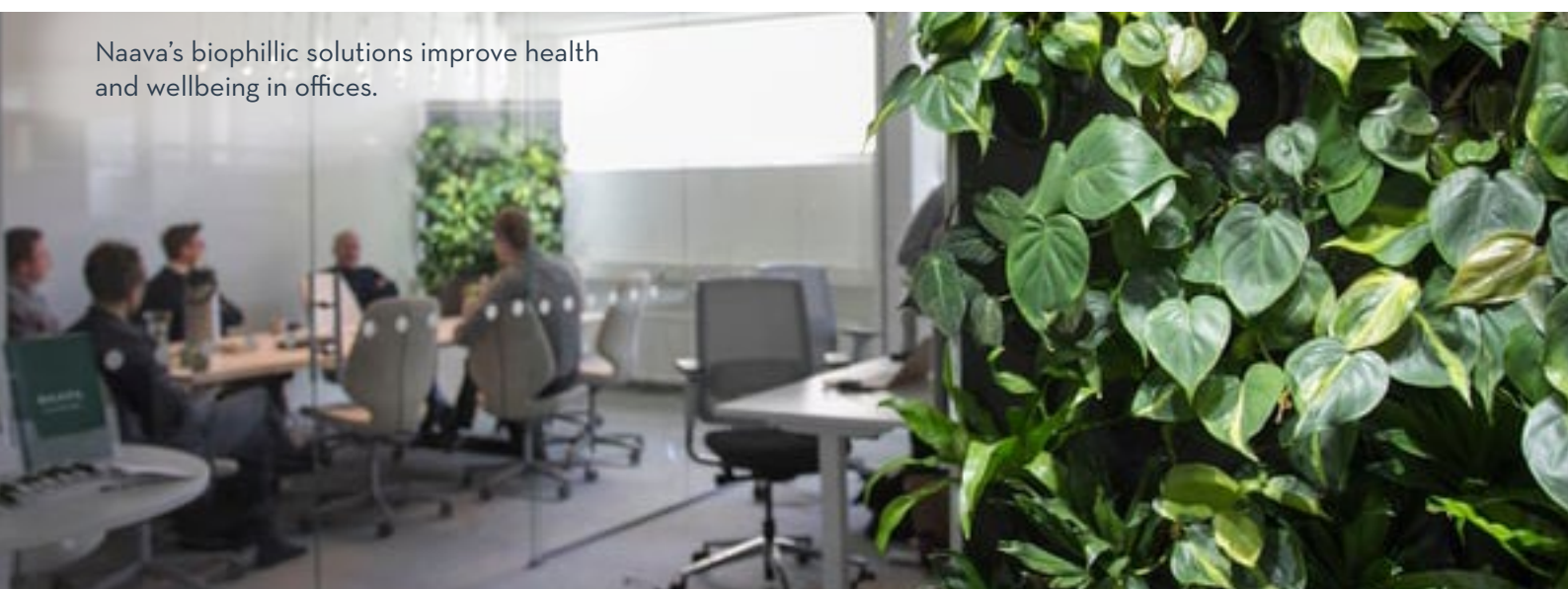
Ecological assessments that are usually completed by a certified ecologist to assess the environmental impact of a project, including exposure or possible impact on local threatened or endangered flora and fauna. Once an understanding of the negative impact of a development project is known, and major loss threats calculated, mitigation strategies are proposed and executed for inclusion during construction.

Whereas the movement towards biodiversity and nature as a consideration is about restoring and protecting biodiversity and natural assets, whether or not it is threatened or endangered, and taking a whole of system view. For real assets and cities, there is a strong focus on restoration of nature and biodiversity. Nature is often considered in terms of offsets and off-site solutions, although increasingly we are looking to solve for biodiversity and bringing nature back into our cities.

Managers and owners are starting to ask themselves “how can we bring nature back to our buildings and contribute to improved local biodiversity?”.

<sup>1</sup> <https://www.weforum.org/press/2020/01/half-of-world-s-gdp-moderately-or-highly-dependent-on-nature-says-new-report/>

Naava's biophilic solutions improve health and wellbeing in offices.



Empirically we know that nature and natural systems are critical to our ongoing prosperity, health and success. But what are our governments doing to address and control the risk?

Policy makers, investors and lenders are beginning to require the assessment of nature-based financial risks and business impacts on biodiversity. This is increasingly driven by the Task Force on Nature-related Financial Disclosure (TNFD) framework. As with climate related risk disclosure, TNFD is anticipated to become the global standard for nature-related disclosure.

France is a leader in this space. Today, Article 29 of the Energy and Climate Law requires disclosures of biodiversity and climate impact of companies and investors. They must measure their alignment with the objectives of the Convention on Biological Diversity and analyse the contribution of their portfolios in reducing pressures and impacts on biodiversity.

Similarly, the European Union (EU) has launched a biodiversity strategy for 2030. The protection and restoration of biodiversity is one of the main objectives of the EU green taxonomy and Sustainable Finance Disclosure Regulation (SFDR) requirements. Plus, under EU SFDR regulation, impact on biodiversity is a key mandatory indicator that defines a 'sustainable investment'.

In Australia we have also seen an evolution in nature and greening policy drivers. In 2023, The 'Nature Positive Sydney' position paper was released by the committee of Sydney, committing the group to lobbying the government to taking action on mandating city greening and improvements in nature-based solutions on our buildings. Similarly, Melbourne has launched the 'Green our city strategic action plan' which has led to Amendment C376: Sustainable Building Design, which will mandate a proportion of new roof tops to host greenery and biodiversity.

We are also witnessing the development of a number of nature related frameworks to support the global community in tracking, prioritising and reporting on nature and biodiversity efforts. These include TNFD,

and earlier in 2023 the Science Based Target Network (SBTN) consultation on nature, as well as the Global Reporting Initiative (GRI)'s consultation on nature related disclosures. In following this trend, many green building certifications are increasingly considering nature and biodiversity restoration efforts for credits, including GRESB, BOMA, LEED and others.

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**“Biodiversity and nature considerations are of paramount importance to real asset organisations, not just because of the resources our ecosystems offer, but because the sector must take responsibility for the impacts of its operations, businesses, and assets. In addition, because investing in natural capital outcomes can have a positive, measurable impact, biodiversity and nature are an emergent priority for many investors looking to build sustainability into their investment portfolios.**

**For GRESB, being an industry-led and investor-driven organization means that we put the voice and priorities of our members at the forefront of our work. As such, the GRESB Foundation will consider and continue to build consideration of a company’s approach to biodiversity and nature protection and restoration in the current and future versions of the GRESB Standards.”**

Ruben Langbroek, Head of Asia Pacific - **GRESB**

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It is clear that nature and biodiversity are the next frontier of sustainability, and that stakeholder expectations require action to drive nature-positive outcomes. This is a sentiment that will likely equal that which we see today for climate change due to the threat posed to our communities. As such, organisations that take action today will reap the benefits of competitive advantage and reputational differentiation, not to mention de-risking future operations. But how is this achieved? How do we drive nature into our properties and our cities?

## Implementing biodiversity across real assets - practical steps

Beyond aesthetics, nature regulates our environment and natural systems. Water supply to urban areas commonly originates from catchment areas within or beyond the city boundaries; these catchment areas are sustained by natural ecosystems that store and purify the water. Urban greenery replenishes oxygen and clears the air, sequesters carbon, absorbs heat to reduce heat island effects, reduces human stress, maintains water balance and regulates surface temperature in urban landscapes through shading and evapotranspiration.

The benefits of flora and fauna biodiversity and their contribution to natural capital are extensive and should not be dismissed. Those that relate to cities and people include, but are not limited to:

- Reduced heat island affect
- Improved resources such as food
- Cleaner and healthier air and water
- Improved wellness and happiness of people
- Protection and prosperity of flora and fauna
- Increase connection of people with the environment
- Environmental awareness education and engagement
- Green premium for rental yield and capital value of assets

Asset owners and managers can play a key role in preserving and restoring biodiversity, and are beginning to see this reflected in green building certification credits linked to biodiversity preservation and restoration. For example, GRESB, GRI, BOMA, the World Green Building Council, and other certifications have or propose to include biodiversity and nature related credits in their schemes moving forward. This means, as has happened with climate mitigation and carbon efficiency, asset values and rental yields will be linked to the biodiversity contribution of particular spaces. Natural or nature-based solutions will be used to differentiate spaces and claim green premiums.

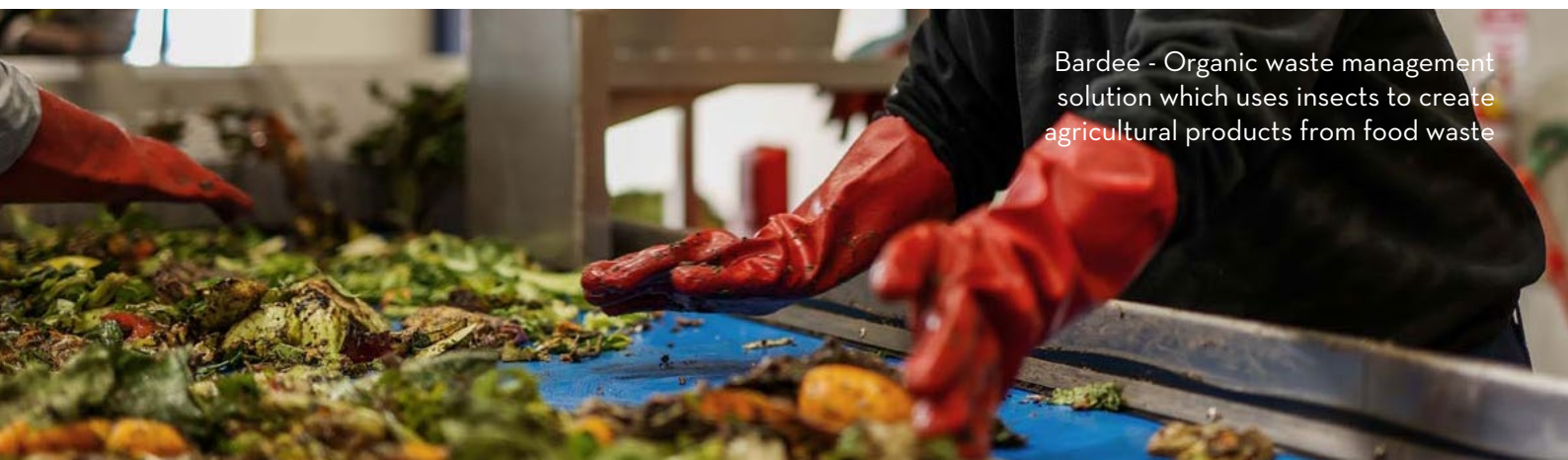
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**“One of the biggest shifts we have seen is that the global institutions are putting significant amounts of capital to drive ESG into their assets - including a much greater openness to support better biodiversity.”**

Jonathan Hannam, Co-founder & Managing Partner,  
**Taronga Ventures**

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Research by the University of Technology Sydney (UTS) found the green roofs bring benefits beyond increasing biodiversity. As well as increasing biodiversity by 6-85%, green roofs lead to on-site solar systems being more than 3 to 30% efficient due to reduced radiant heat. Green roofs can lead to roof temperatures being 20 degrees cooler than those without. Resulting in reduced heat island effect, but also lowered cooling load within the asset.



Bardee - Organic waste management solution which uses insects to create agricultural products from food waste

Initially, an organisation or building should focus on mapping out its impacts and dependencies on biodiversity and its preservation or restoration.

Outlining methodologies that will address trade-offs and promote biodiversity thinking in decision-making and management is a strong place to start.

Strategies for increasing the biodiversity credentials of a property or city include, but are certainly not limited to **green roofs** or **green spaces**. Similarly, there is an increasing movement towards the reintroduction of **pollinators** such as bugs and bees into city spaces to support local flora prosperity.

**Biophilic design**, which introduces nature to built spaces, can improve both the atmosphere and air quality within a building but also has proven positive benefits for mental health and wellness which contribute to productivity.

Ivanhoé Cambridge have worked to incorporate biodiversity into a project that is currently under

development in Montreal. The Haleco project has been designed to celebrate the coexistence of nature and community, focusing on the natural synergies between sustainability and wellbeing. Biodiversity is core to the project, with common green spaces, a vegetable garden and a pollinator garden that will be open to the general public which contributes to regenerating the area's vegetation. The project should also include an urban farm and a 'Fab Lab' - a centre for upcycling and repair that can set an example of how circular and local economy can coexist within an urban environment.

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**“The question we must ask ourselves is how we can put more nature into cities, buildings and spaces we occupy. The ‘S’ in ESG can also play a role here too - where social factors such as wellness naturally intertwine with environmental improvements”**

Nathalie Palladitcheff, President and Chief Executive Officer - **Ivanhoé Cambridge**

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Ivanhoé Cambridge's Haleco project in Montreal



Bardee's black soldier fly end products - carbon positive insect protein and fertiliser

## What are the risks, opportunities and key considerations of biodiversity in real estate?

Many of the risks and opportunities associated with nature and action or inaction are similar to those associated with climate change as nature influences and is impacted by climate change, and vice versa.

Risks:

- Reputational
- Regulation
- Higher cost of capital, equity and debt
- Physical risks due to loss of resources and a changing climate
- Brown discount on assets on contributing to biodiversity gain

Opportunities:

- Market differentiation
- Green premium
- Tenant engagement, wellbeing and productivity
- Lower cost of capital
- Improved quality of assets

When thinking about incorporating nature into an asset or corporate program, there are a few important considerations that should be front of mind:

- Nature must be thought of as double edged - the impacts loss or restoration will have on your asset or company, but also your own impact on nature and biodiversity through your operations
- Nature and biodiversity form an ecosystem and thus must be thought of beyond the four walls of a building. Collaboration is key and must be thought of in a systems frame

Nature influences other issues and opportunities, such as climate change, so linking nature to these better understood concepts is powerful and important.

## What should a nature-positive strategy include?

When creating a nature positive strategy, companies should consider building on these four key elements:

- Demonstration of positive biodiversity, nature and related outcomes across the entire value chain
- Buy-in throughout the entire organisation
- Integrated consideration of different components of nature (i.e. both biodiversity and climate)
- A foundation in, and view of measurable outcomes against a fixed baseline which is aligned with overall societal goals - i.e. Sustainable Development Goals (SDGs) and COP15 framework

Generally, there are five aims that real asset owners, managers and occupiers can implement in buildings and cities:

- Protect biodiversity value; encourage development on land of limited biodiversity value and protect land with high biodiversity value
- Minimise the asset's biodiversity impact on-site during construction and operation
- Enhance ecological value and biodiversity; add flora and fauna to the site as a first priority, including green roofs to restore flora volumes, facilities for pollinators, bees and insects, protection of fauna species such as bird boxes etc
- Connect biodiversity and ecological networks; link or maintain connections between native or built landscape corridors. This is where collaboration between buildings and building owners becomes incredibly powerful to protecting and restoring the biodiversity value of an area
- Create and manage on-site and off-site natural spaces; construct new natural environments within the built environment and encourage the maintenance of enhancements on-site and off-site

## Case Studies - Alvéole

Alvéole is an urban beehive company that helps companies transform their property into bee-friendly spaces. Its beehive and bee hotel installation and maintenance service optimises underused spaces in assets. The solution tracks and boosts biodiversity, and engages occupants.



### Ivanhoé Cambridge / Alvéole

Ivanhoé Cambridge have been working with Alvéole to expand biodiversity across their assets and wider cities. Across the last 6 beekeeping seasons, Ivanhoé Cambridge and Alvéole have rolled out 37 beehives at 18 locations.

On behalf of Ivanhoé Cambridge, Alvéole have harvested 1,110 pounds of honey, with their bees supporting and pollinating 508 square metres.



### CBRE / Alvéole

CBRE has also partnered with Alvéole, an urban beekeeping and green roof solution company across a number of their facilities.

Urban beekeeping offers value to the property and city including increased biodiversity and biodiversity insights, improved tenant engagement and tenant wellness through their engagement programs.

To date, the Alvéole and CBRE partnership has resulted in 2.2 million honeybees being adopted across 44 hives and 29 separate locations.

As part of the program, Alvéole harvest honey from the colonies, on behalf of CBRE, resulting in 4,400 jars of

local honey to date. From the data Alvéole collect from the beehives they have found that 366 square metres have been pollinated by the CBRE travelling bees.

Additionally, Alvéole provide education and engagement services to the participating CBRE properties and property communities. This is done through workshops and onsite engagement sessions with the hives, as well as through the Alvéole online portal which has reached over 235,000 people.



## The value of nature and biodiversity for cities, buildings and people

As established in this paper, the benefits of nature and biodiversity are numerous and can be considered for people, properties and cities. Research has linked nature to all 17 Sustainable Development Goals, indicating the entrenched reliance and value of nature in our systems and communities. Meaning the value is significant and influences all components of our planet and people.

The below table considers the direct benefits nature and biodiversity activities offer to people and places.

	Cities	Buildings	People
<b>Climate change and the environment</b>	<ul style="list-style-type: none"> <li>• Reduced heat island effect</li> <li>• Carbon emission reduction and sequestration</li> <li>• Protection and restoration of nature, including habitat</li> <li>• Increased biodiversity of flora and fauna in the local area</li> <li>• Air filtration</li> </ul>	<ul style="list-style-type: none"> <li>• Anthropogenic noise and natural sound protection</li> <li>• Air purification</li> <li>• Reduced heat island effect, reduced need for cooling of asset</li> </ul>	<ul style="list-style-type: none"> <li>• Education of people towards nature and environmental activism</li> </ul>
<b>Health and wellbeing</b>	<ul style="list-style-type: none"> <li>• Improved linkage to environment of people</li> <li>• Improved connectivity of the buildings in cities and understanding of interconnectedness</li> </ul>	<ul style="list-style-type: none"> <li>• Improvement of worker health and productivity</li> <li>• Reduction of worker stress by access to greener spaces</li> <li>• Improved connection of buildings with spaces, environment and people</li> <li>• Improved social connection</li> </ul>	<ul style="list-style-type: none"> <li>• Mental and physical health outcomes</li> <li>• Local sourcing of food</li> <li>• Reduced anxiety and improved health</li> <li>• Improved productivity</li> </ul>
<b>Value and economic impact</b>	<ul style="list-style-type: none"> <li>• Passive storm water management</li> <li>• Resilience to extreme weather events</li> <li>• Attracting people into cities</li> </ul>	<ul style="list-style-type: none"> <li>• Improved asset value through green premium</li> <li>• Cooler and healthier buildings</li> </ul>	<ul style="list-style-type: none"> <li>• Improved social cohesion and socialisation leading to economic stimulation</li> <li>• Liveability of spaces and buildings, attracting users</li> <li>• Improved value of their assets and spaces</li> </ul>

Rapid global urbanisation and a march towards cities is leading to a change in land use, landscapes and the reduction of biodiversity globally. Negative impacts of urbanisation such as fragmentation, biodiversity loss and urban heat islands mean it has never been more important for our buildings, infrastructure, and cities to consider the protection and restoration of natural assets. Buildings, building owners and communities have an incredible opportunity to drive a significant difference in global biodiversity and reap the many benefits that result from the inclusion and protection of nature in our cities and spaces. Like climate change and associated mitigation measures, regulations and expectations from stakeholders will balloon around nature; businesses and building owners will be required to contribute to nature-positive solutions or face being left behind.



### About Rebecca Jinks:

Rebecca is the Director of ESG & Sustainability for Taronga Ventures and leads its ESG Advisory business. With over a decade of working at the intersection of ESG and real assets, Rebecca and the Advisory team have supported clients to design, build and deploy their ESG strategies.

If you would like to find out more about how we can help you incorporate ESG and biodiversity into your portfolio and properties, visit [tarongagroup.com/advisory](https://tarongagroup.com/advisory).

