

Promoting nature-based solutions to stormwater in our urban areas

How Nature-based Solutions can be applied to stormwater and flood management, and what's needed to encourage greater understanding and uptake of these holistic approaches.

Nature-based solutions involve working with nature and natural processes to address societal challenges brought about by human impacts on the natural environment. They include the protection, restoration or management of natural and semi-natural ecosystems; the sustainable management of aquatic systems and working lands; and integration of nature in and around our cities.

Nature-based Solutions (NbS) treat stormwater as a visible and integrated asset that meets environmental and societal challenges. It bridges the 'climate adaptation gap' by creating less carbon-intensive infrastructure, being an adaptable and resilient system to change, and sequestering carbon in plants and soil.

The important concepts of NbS relate to working with natural and modified ecosystems to address a societal challenge through adaptation.

Earlier this year, Boffa Miskell landscape architects Mark Lewis and Liz Gavin hosted an expert panel and group workshop at the 2024 Stormwater Conference. Panellists and attendees discussed their experience with Nature-based Solutions, the challenges and benefits they had encountered, and explored potential methods to broaden the uptake of NbS.

Some recurring themes emerged:

The financing of infrastructure was a significant focus. It's anticipated that new methods of financing will become more mainstream – including public-private partnerships, utilising social or environmental impact bonds (SIB/EIB), or stormwater credits – to achieve projects that may not otherwise be possible. Incorporating green infrastructure incentives – including methods such as tax benefits and carbon credits will enable a better uptake of these assets.

Monetising benefits, including the intangible assets associated with amenity and biodiversity values, will be required if the true value of NbS compared to traditional infrastructure is to be understood. To be effective levers for decision-making, these values must be measurable and applicable

as performance indicators to business case frameworks.

Currently, traditional stormwater infrastructure in the built environment such as gutters, drains, pipes, and retention basins are not compared against NbS for the same outcomes. Equally, the depreciation applied to 'grey' infrastructure does not recognise the true replacement cost, which would likely be comparable to the ongoing maintenance costs typically associated with NbS, without realising any of the same benefits.

NbS typically appreciate as an asset, as vegetation matures and higher numbers of the public engage with these systems. This is not often considered in business case reviews.

Emotional impacts from potential and experienced trauma are the main drivers in attitude change and acceptance of the level of risk at a personal level and at a community level. When a catastrophic flood event has been experienced first-hand, the community is willing to listen to and consider major change to where and how they live. It was noted, however, that over just a short period of time these impacts can be forgotten, and change is then resisted again.

Community engagement is key to positive change. Involving community in decision-making will inform both the community and the project delivery and provide the 'social licence' to enable supported environmental action. Robust discussions about how a community will adapt, develop, or retreat in response to climate-related risk; and the level of acceptable risk acceptable at a community level, are encouraged.

Community ownership or adoption of NbS-related facilities and assets was raised as a way of increasing knowledge of Nature-based Solutions, and of ensuring that these facilities and assets were well-maintained beyond their delivery. Rates rebates could be incorporated into maintaining these assets. Subdivision design could incorporate NbS into the design from the outset and establish community expectations on what they are for and how they should be managed (including financially).

Legislation and guidance tools supporting the use of Nature-based Solutions as a primary approach is required to give NbS support at a national level. This would be achieved through policy development that calls for community engagement on decision-making and evaluation standards that ensure a consistent approach of assessment and development.

Communication is key. Understanding the audience and finding the right medium to convey information is an important part of gaining community trust and involvement for Nature-based Solutions.

Risk understanding and quantification is important for Councils and community. Therefore, it is crucial for Councils to provide access to data around rain/flood events and relay levels of risk to their communities. Concurrent with risk evaluation is the importance for Councils, industry, and communities to discuss the wide ranging environmental and societal benefits of Nature-based Solutions.

Planning for operational and maintenance costs of Nature-based Solutions and understanding ownership of these responsibilities is critical to the successful functioning and longevity of the asset, particularly in relation to creating the skill-base to maintain NbS appropriately.

Opportunities for large-scale and aspirational NbS should be explored to consider the different climate-related risks faced at a district or regional level and provide a holistic response to climate change impacts. A broad and integrated network of Nature-based Solutions could provide large-scale functions such as arresting fire-spread, accommodating sea level rise as an adapted coastal system, and protecting hillslopes from erosion.

Workshop attendees provided many examples of NbS contributing positively to their towns and cities, and indicated that there was an appetite for Nature-based Solutions in stormwater infrastructure. Continued efforts to motivate the implementation of NbS across the country is needed to drive and enable policy, guidance, and financial mechanisms to facilitate these approaches.

Article provided by Boffa Miskell