

Briefing Paper: What are Nature Based Solutions?

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What is it?

The official definition is “actions to protect, sustainably manage, and restore natural or modified ecosystems, that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits”. Essentially this is about using nature to solve problems.

Examples of Nature Based Solutions

There are many types of project that could count as nature based solutions. Using saltmarshes (or mangroves in tropical areas) to reduce coastal flooding and erosion, planting wildflowers to attract pollinators and minimize fertilizer use, sustainable urban drainage systems and replanting forests in catchment areas to reduce flooding are all examples.

Why do this?

There are few problems that natural systems have not managed to overcome. Indeed many “solutions” are actually restoring the environment to its natural state. If we take the example of saltmarshes and coastal flooding then we find that these used to be prevalent but were then removed. They are also a huge source of carbon sequestration so if you replace a structure with huge amounts of associated pollution (like a concrete wall) then the problem is solved more effectively, more long term and CO₂ is now being absorbed. For many people cost is the main reason, there are few situations where plants cost more than concrete and easily outweigh the costs of potential damage such as flooding. Most nature based solutions tackle multiple problems simultaneously, planting trees in a river catchment will reduce the downstream flood risk but will also increase biodiversity and carbon sequestration. Similarly using wildflowers to attract pollinators instead of using fertilisers will mean an increase in wildlife, no risk of run off polluting rivers and creating a self sustaining ecosystem that doesn’t take a lot of management each year.

Sustainable Urban Drainage Systems (SuDS) is also a nature based solution. These projects take water from roofs and run off areas in urban environments and use the water to make artificial ponds and ditches. This greatly reduces the flood risk and the resulting pond is great for wildlife. These ponds and ditches should be constructed so that they can overflow or flood safely in the case of extreme events.

The UN estimates that at least one third of climate mitigation should be nature based solutions.

Why is it not more common?

Often there is a lack of awareness and understanding around nature based solutions that means many don’t ask about them. It is also true that not all engineers are taught to look for them either. Thirdly, there is often a degree of skepticism that plants and natural solutions could be as effective as man made solutions. However it is absolutely true that nature based solutions are effective and there

is a huge wealth of evidence to back this up. Fortunately they are becoming more common with modern day engineering firms actively working in this area and having a good understanding of ecology.

Is it being done?

Yes! Nature based solutions are becoming more and more common across institutions and private organisations.

- The University of St Andrews is currently working on [saltmarsh restoration](#) to prevent erosion and coastal flooding around the Eden Estuary which is where the famous golf course and Leuchars military base are located.
- Queen Margaret University in Musselburgh is utilizing a [Sustainable Urban Drainage System](#) to take water from it's roof to form an artificial pond. The [Athletes Village](#) in the Glasgow Commonwealth Games also utilized SuDs
- The University of Strathclyde is currently [planning a redevelopment](#) of it's campus to include green space. This project also serves to increase their active travel capacity by providing safe areas to walk and cycle.
- The University of Glasgow is utilizing "[Green Screens](#)" to reduce rainfall run off, improve air quality and provide habitats for wildlife.

Summary

Nature based solutions can be highly effective in tackling many of the problems relating to climate change. They can offer significant benefits over "engineered solutions" and whilst solving the issue they are also absorbing carbon dioxide. Bear in mind that many engineered solutions will use concrete which is very energy intensive to produce and so the net saving of using vegetation is quite significant. Effective nature based solutions can be cheap and self sustaining. Whilst they cannot tackle every problem on their own there are almost no situations where their addition can have a negative effect, they can even be combined with engineered solutions. In many respects they are the ideal way to combat the climate and ecological crisis that we are currently faced with.

Further Resources

- [Nature Based Solutions Overview](#)
- [Mangroves as Flood Defences](#)
- [Nature Based Solutions In Urban Environments](#)
- [Cities of the Future](#)