

Soil security just as critical as aircraft safety

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Soils and the cities they serve are set to benefit from a new mix of engineering and environmental science, thanks to a five-year fellowship.

Dr Jess Davies, lecturer in sustainability at the Pentland Centre for Sustainability in Business at Lancaster University, has been awarded an Early Career Fellowship from the Engineering and Physical Sciences Research Council as part of their 'Living With Environmental Change' programme to take an engineering approach to soils.

Dr Davies, who started out her career in engineering studying safety critical systems for aircraft, has been researching plant, [soil](#) and water systems at Lancaster University for the last six years.

She said her experience had led her to believe that we need to take a new approach to soils, one which acknowledges them as a [critical infrastructure](#) for society and for our planet.

She said: "Soils are our life support system, and are every bit as much a safety critical system as an aircraft. Soil system failure is a disaster for the societies they support, we only need to look to the American dust bowls of the 1930s to see that. The only difference is that in the aircraft industry the impacts and trail of liability for failure is obvious. Responsibility for soils and our environment is much more complex and lies with us all to greater and lesser extents."

Soils are important for all of us, providing the vast majority of our food, regulating water flows and helping mitigate floods and droughts. They are also a key player in climate change itself. Soils are a huge store of carbon. Loss of that carbon may accelerate climate change, and conversely if soil carbon storage is increased then this may help mitigate against climate change in addition to having other benefits for ecosystem function.

Dr Davies added: "Soils are a physical [infrastructure](#) in our environment that provides multiple services to society and ecosystems. But we don't have the blueprints of this infrastructure. We don't understand the resilience of this infrastructure to [climate change](#) or changing soil management.

"It's not all doom and gloom though, understanding soils as an infrastructure also gives us an opportunity to invest in it , to enhance our environment, our food, our water, our lives. I firmly believe that trying to understand the value of soil as a critical infrastructure is a great first step towards increasing our resilience to [environmental change](#), and the sustainability and well-being of our society. I am hugely grateful to get the support of this fellowship to take this idea forward."

The fellowship provides £935,000 over five years to support this research developing new soil infrastructure simulation models and analyses that span food-water-carbon services, and to support a new network of soil managers, stakeholders and researchers.

She added: "We need to bring together water companies, farmers, county councils, regulators, manufacturers, retailers, insurers, conservationists, land owners, agribusinesses and communities to act as a working group for soils."

Dr Davies will spend the first month of her fellowship on secondment at the World Business Council for Sustainable Development (WBCSD), which is a CEO-led forum of 200+ global corporations that works to galvanise the global business community on sustainability. She will use this time to connect with global businesses that rely on soil infrastructures and have a huge influence on their future.

Dr Davies will also be working closely with the JBA Trust to understand soil infrastructure risks. JBA in collaboration with LEC recently took first steps towards assessing how nature is being used to reduce floods by cataloguing existing green infrastructure schemes and supporting the Environment Agency in research to identify the evidence needed to understand their benefits.

This fellowship will help build an evidence base for managing soils in reducing risks, whilst also delivering food, water and carbon benefits.

Provided by Lancaster University

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