OXFORD BROOKES UNIVERSITY

Research, Innovation and Enterprise: Shaping The Future 2025-2026

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Introduction

At Oxford Brookes University, we are driven by a shared commitment to tackling some of the most pressing challenges of our time. Our research spans several disciplines and sectors, with one unifying goal: to make a real, positive impact on the world.

This issue of Shaping The Future celebrates the breadth and depth of that work, showing how our researchers are addressing key global challenges, such as climate change, pollution, health and food security, which align with the UN's Sustainable Development Goals (SDGs).

The work presented here demonstrates the power of innovation, collaboration and dedication. From bioengineering plants to combat climate change, to pioneering research on energy efficient housing, our researchers are pushing boundaries to find solutions that not only address today's challenges but also pave the way for a more sustainable, equitable future.

It's inspiring to see the impact that our academic community is having - not just within the walls of the university, but in the world around us. At Brookes, we are proud to contribute to the global conversation and to the work that is shaping a better tomorrow.

This publication is a testament to the commitment of our researchers and the ongoing pursuit of knowledge that truly matters. We hope it inspires you as much as it does us to continue working towards a brighter, more sustainable future for all.

PROFESSOR JOSEPH H. M. TAH
Pro Vice-Chancellor, Research and Innovation

The UN's Sustainable Development Goals

The Sustainable Development Goals, or SDGs, are a set of 17 global targets created by the United Nations to help improve life for people around the world and protect the planet.

These goals were agreed upon by world leaders in 2015 and are designed to be achieved by 2030. They cover a wide range of important issues, such as ending poverty and hunger, improving health and education, achieving gender equality, providing clean water and sanitation, ensuring access to clean energy, and taking urgent action on climate change.

The SDGs are important because they offer a clear and shared plan for tackling the world's biggest problems. They highlight how these challenges are interconnected - for example, improving education can also reduce poverty and promote better health. The goals also stress that these issues affect everyone, and that change will only happen if governments, organisations, communities and individuals work together.

By encouraging action at every level, the SDGs aim to build a just, inclusive and sustainable future. They provide a framework not only for countries to set their policies but also for institutions like universities to shape their teaching, research and day-to-day operations in ways that support a healthier and fairer world.

IMPACT OF RESEARCH

Sustainable Farming in Indonesia: Growing Profits and Protecting the Planet

Dr Marco Campera helps small-scale farmers in Indonesia adopt sustainable farming practices that boost productivity, protect biodiversity, and improve income.

At the heart of this effort is the Environmental Sustainability Team who are responsible for the day-to-day running of environmental sustainability at Oxford Brookes, from biodiversity and waste management to energy efficiency and sustainable transport.

In many agricultural communities around the world, survival often comes before sustainability. Small-scale farmers in places like Java, Bali and wider Indonesia are focused on making a living, keeping their businesses going and supporting their families. Long-term environmental thinking can easily fall by the wayside - not because the farmers don't care, but because the challenges of daily life are so pressing. Dr Marco Campera tackles this head on, by helping farmers adopt sustainable farming techniques that not only protect the environment but also boost productivity and income.

Working directly with farmers, Dr Campera provides training in organic and sustainable farming methods, particularly in agroforestry (farming that includes the careful use of trees and plant diversity to strengthen the land). In one Javan village, farmers restored their local forest and changed the way they planted crops, layering them in ways that increased yields and protected biodiversity. Because these are often family-run farms, there's more flexibility and openness to trying new approaches - and when the results bring real benefits, other communities take notice.

His work goes beyond reducing agrochemical use. It also explores how farming can actually support biodiversity, rather than damage it. By using fewer pesticides and managing land in a way that mimics natural ecosystems, farmers are able to reduce costs while doing less harm to the environment. What's more, Dr Campera's research looks at how local profits can be better distributed - for instance, by raising funds to build microprocessing facilities that allow communities to process their own products, keeping more value close to home. His work also highlights the potential of underused indigenous crops, helping bring economic and nutritional value to forgotten resources. Through a citizen science approach, local people are actively involved in the research, ensuring the work is rooted in community knowledge and benefit.

Marco's work also connects with Oxford Brookes' values as a Fairtrade university, and through the university's charity - the **People, Plants, Primates Action Fund** - he continues to raise money to support sustainable farming and conservation in the region.

"We're showing that working the land with nature, not against it, can actually improve both biodiversity and farmers' livelihoods. Sustainable practices aren't just good for the planet - they're good for people too."

DR MARCO CAMPERA
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Digital Childbirth: What Really Happened to Maternity Care During the Pandemic?

Dr Antonia Mackay turned pandemic maternity experiences into a play, using real stories to inform more compassionate maternity care in the future.

When the pandemic hit, lots of services moved online - including healthcare. For most people, this was just part of adjusting to lockdown life. But for pregnant women and new mums, it was a much bigger deal. Suddenly, the friendly, in-person support of midwives, doulas and birth partners disappeared. Instead, care was delivered through screens - and for many women, it felt cold, impersonal and more akin to being watched than supported.

Dr Antonia Mackay went through this herself. Having had a baby during Covid, she had firsthand experience of this lack of support. This ultimately inspired her research to understand how other mothers like her had been affected.

Dr Mackay spoke to new mums and healthcare workers, collecting their thoughts and stories through surveys and interviews. But instead of just writing a research paper, she decided to do something different. She turned the findings into a play.

With help from Green Templeton College's Sheila Kitzinger Programme and Human Story Theatre, the play was performed at the North Wall in Oxford. It brought real stories to life and helped NHS leaders understand the real impact of going digital. Earlier this year, the project received Knowledge Exchange funding and has since been redeveloped for an NHS-specific audience, with plans now underway to take the play to more audiences across the country.

The hope is that by sharing these powerful stories, we can shape better maternity care in the future - care that blends technology with real, human support.

"Technology has a place in healthcare, but it can't replace the comfort and connection that new mums need. By learning from what happened, we can do better for families in the future."

DR ANTONIA MACKAY
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Why Children's Sleep Matters - and What We Can Do About It

Dr Georgia Cook's research explores how children's sleep affects their health, learning, quality of life and family wellbeing, aiming to identify causes and practical solutions for addressing sleep disturbance and improving sleep patterns.

Sleep is vital for children's development, yet poor sleep is increasingly common - and the effects can be serious. Dr Georgia Cook is tackling this issue by researching how children's sleep affects not just their health and learning, but also their families' wellbeing and wider society.

Sleep problems in children are linked to difficulties with memory, attention, development and mental health, which can lead to poor school performance and stress at home. For parents of children with sleep problems and adults with sleep disturbance, these issues can have long-term consequences - including days off work, increased healthcare costs and even accidents caused by fatigue. Dr Cook's work focuses on understanding the causes of sleep problems, finding effective treatments and improving the way sleep issues are handled in healthcare.

One major project focused on children with epilepsy, who often have trouble sleeping. Dr Cook worked closely with the children and their parents to co-produce the research, making sure it reflected their real experiences and needs.

By adapting sleep techniques used successfully with neurotypical children as well as those with ADHD or autism, the team helped families improve sleep patterns - with children falling asleep nearly 20 minutes faster.

Dr Cook is also working with school nurses and other healthcare professionals to help them recognise and respond to sleep-related problems, something that many healthcare professionals aren't adequately trained to do. Another area of her upcoming research will explore whether simple, low cost approaches - like blackout blinds or white noise machines - can improve sleep in homes, hospitals or care settings, and aims to strengthen the evidence base for these widely used interventions.

She also shares the findings of her research through training and knowledge exchange with parents and healthcare professionals, helping ensure that good quality, evidence-based sleep advice reaches the people who need it most.

"If we support children to sleep better now, we're giving them - and their families - a better chance at health, learning and happiness in the long run."

DR GEORGIA COOK
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Banking on Health: Helping Young People Eat Well for Themselves and the Planet

Oxford Brookes' Banking on Health project collaborates with young people and families to learn about cooking affordable, nutritious and sustainable meals.

In the UK today, many young people are missing out on healthy, sustainable food. Rising living costs and low awareness around nutrition mean families often struggle to cook meals that are good for their health and the environment. Dr Shelly Coe, Dr Sarah-Louise Mitchell and Professor Patrick Alexander are tackling this problem through their new project, Banking on Health.

The project focuses on food education for school-aged children and their families, aiming to improve both health and sustainability outcomes. Through workshops delivered in state-of-the-art nutrition workshops on Brookes campus, the team hopes to build 'nutritional literacy,' helping young people understand how to cook low cost, nutritious meals using sustainable ingredients.

Dr Coe, a Senior Lecturer in Nutrition, has seen first-hand how nutrition education is often missing in both very young and older age groups. She believes that if children learn these life skills early, they're more likely to carry them into adulthood.

Oxford Brookes students from the School of Nutrition and the Business School have cocreated and led the workshops, making the sessions interactive and grounded in real-world collaboration. The team hopes to scale the project into a wider programme, reaching more schools and even developing a toolkit that schools and parents can use on their own.

For Professor Alexander, whose background is in education and anthropology, this is also about changing how we think about learning. His research highlights how schools often prepare students to succeed in a competitive, profit-driven economy; the same system that contributes to climate and health inequalities. If education continues down this path, he argues, it will be unable to support the real change the world needs.

Professor Alexander, Dr Coe and Dr Mitchell are members of the Children & Young People Network at Oxford Brookes. The Network brings together researchers from different disciplines to collaborate on real-world challenges affecting children and young people.

"We want young people to see that healthy, sustainable food doesn't have to be expensive or boring - it can help bring people together and be an enjoyable addition to everyday life."

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Find out more:

Our Earth, Our Futures: How Children Are Leading the Way in Climate Education

Our Earth, Our Futures helps children learn about sustainability through creative activities and cross-cultural collaboration, making climate education engaging and personal.

Teaching children about climate change and sustainability can be challenging - especially when schools don't always have the tools or confidence to cover these complex topics in meaningful ways.That's where Our Earth, Our Futures comes in: a research partnership between Oxford Brookes University and The Maldives National University and schools in the UK and Maldives, led by Dr Claire Lee and Dr Aminath Shiyama.

The project responds to the need for more engaging and relevant sustainability education. Rather than teaching children about climate change through facts alone, it gives them the chance to explore their own ideas and share their knowledge of their local environments through art, digital projects, and cross-cultural exchange. Children took the lead on everything from climate-themed posters and t-shirts to designing future homes and gardens for biodiversity and exploring issues like gender equality.

By involving children directly, the project shows that sustainability education is about real lives and personal action - not just scientific fact. In the words of one of the teachers involved:

> "They're going to gain so much. It doesn't have to be 'Can you answer these questions about climate change?' It can be measured in conversations with children, how they live their lives, how they take on what they've learned, and what they do with it in the future."

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Find out more:
www.ourworldourfutures.org.uk

When Education Isn't Enough: Why Nigerian Women Face Persistent Wage Penalties in the Labour Market

Amina Mahmood Yakubu is investigating why rising educational attainment has not translated into wage equity for Nigerian women, particularly in the informal sector, and how education can still be leveraged to reduce inequality and foster broader economic progress.

Despite Nigeria's policy efforts to promote gender equity, including the Universal Basic Education (UBE) scheme and the Gender Equality Duty Act of 2007, significant gendered wage differentials still persist. In the formal sector, a "sticky floor" effect disproportionately traps women at the lowest wage levels. While in the informal sector, women earn less than men across the entire wage distribution. These gaps persist notwithstanding rising education levels among women. Globally, while progress is being made to close economic gender gaps, in countries like Nigeria structural barriers remain deeply entrenched. Factors such as marital status and limited access to quality education continue to shape women's opportunities and wages.

Amina Mahmood Yakubu, a research student, focuses on the economic value of education in Nigeria. She is investigating how improving access to education can enhance women's wages, empower them socially and economically, and expand opportunities in the labour market. Her work makes a strong case for investing in women's education, showing how it could drive productivity and encourage innovation across the labour markets and society.

Along the way, Amina has also uncovered wider challenges for researchers in developing countries, particularly the lack of reliable employment data in Nigeria, which makes studying labour market inequalities more difficult.

Drawing on her own experiences growing up in northern Nigeria, Amina hopes her research will influence policy discussions around the UN's Sustainable Development Goals (SDGs). She believes that expanding education for women will not only contribute directly to achieving gender equality but also help drive progress across all areas of sustainable development.

> "As someone from northern Nigeria, I've seen firsthand how gender can define your access to education. With growing resistance to diversity, equity and inclusion globally, this research feels even more vital now."

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5 GENDER EQUALITY

The Women Behind the Camera: Rewriting Italy's Film History

Professor Daniela Treveri Gennari's research is uncovering the overlooked contributions of women in postwar Italian cinema, reshaping film history and challenging gender inequality in the creative industries.

For decades, the story of postwar Italian cinema has focused almost entirely on famous male directors and producers. But this version of history leaves out the vital contributions of women who worked across the industry, behind the scenes and behind the camera.

Professor Daniela Treveri Gennari is challenging this narrow view. With support from the Arts and Humanities Research Council and in collaboration with the University of Warwick, her latest project is uncovering the hidden roles women played in building one of the world's most influential film industries.

The research takes a two-pronged approach: examining archives to recover stories that have been overlooked, and interviewing nearly 40 Italian women in film - including editors, screenwriters, producers and more - to hear firsthand how gender inequality shaped their careers.

Because so few women were formally recognised in film history, many of their stories have gone unrecorded. This project is working to change that.

Daniela's work supports broader goals of gender equality and reducing inequality, and also redefines what sustainability means: not just caring for the environment, but preserving cultural memory and recognising the legacies of those who came before us.

By shining a light on these forgotten figures, the project aims to influence not only how we view the past, but how future generations approach gender in the creative industries.

"To truly understand sustainability, we must also preserve the stories and legacies of those who built our cultural worlds - even if history forgot to write them down."

PROFESSOR DANIELA TREVERI GENNARI
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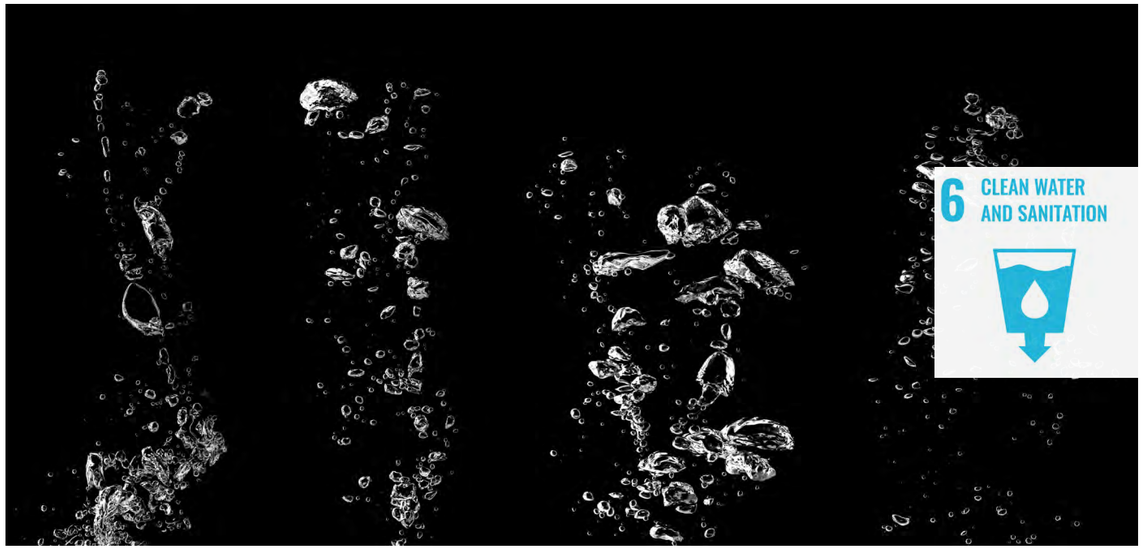

6 CLEAN WATER AND SANITATION

A Drop of Innovation: Pioneering Clean Water for a Sustainable World

Oxford Brookes is pioneering a low-energy, chemical-free water purifier to improve global access to clean water.

Around the world, millions of people still don't have access to clean, safe water. In many developing communities, women often spend hours every day walking long distances to fetch water for their families. At the same time, countries everywhere - including in Europe - are facing growing pressure to improve water quality by removing harmful chemicals and micropollutants that are linked to cancer and other severe illnesses.

Finding a solution that's affordable, eco-friendly, and easy to use in different environments is critical. That's where Professor Iakovos Tzanakis at Oxford Brookes University comes in.

Professor Tzanakis, an expert in Engineering Materials and Bubble Dynamics, is leading ground-breaking research into new technologies that could transform access to clean water. He has developed a compact, energy-efficient water purification device that doesn't rely on electricity, making it ideal for rural or remote areas. Instead, the system uses pressurised gas and a process called hydrodynamic cavitation, which creates powerful microbubbles to clean the water without chemicals. And it only takes 30 minutes.

What makes this even more exciting is how adaptable it is. The reactor can slot into existing water treatment plants, or be set up as a standalone unit in places with limited infrastructure. This means it could be placed closer to people's homes, or within as a home-kit - cutting down the time and effort needed to collect water and helping improve health and daily life, especially for women and children.

Professor Tzanakis's wider research also focuses on sustainable materials and technologies that support a healthier and greener future - from better drug carriers to smarter wind turbines. But it's the water purification reactor that could have the biggest global impact.

"Water, after all, is life, and literally nothing can survive without it."

PROFESSOR IAKOVOS TZANAKIS
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Giving Voice to Autistic Senior Leaders

Caroline Duncan is researching the experiences of autistic senior leaders to better understand their successes, challenges, and how workplaces can support neurodivergent professionals to thrive.

Employment opportunities for autistic people have been limited, as highlighted in the government's Buckland Review, and even fewer reach leadership positions, finding themselves stuck below a 'glass ceiling'.

Caroline Duncan, a research student, is focused on telling the stories of autistic people who do reach senior leadership positions. She is studying how autistic leaders have experienced their work journeys and how their leadership styles may differ from their neurotypical colleagues. By collecting and analysing the stories of the lived experiences of senior autistic professionals, Caroline hopes to challenge stereotypes and highlight both common strengths and unique perspectives that autistic leaders bring to organisations. Participation is key to the research and Caroline brings her lived experience, having also worked with members of the autistic community in designing the study.

Her work reinforces the fact that autism is heterogeneous - while the leaders share similarities, they also experience many differences - and the successes and challenges they face are equally varied. Caroline's research aims to feed into theories like the 'double empathy problem' and develop practical guidance for employers to support career development and sustainable wellbeing for their autistic employees. She also hopes her findings will raise more awareness about how workplaces themselves often make things harder for autistic people, contributing to poor mental health outcomes and physical and emotional exhaustion. With better understanding and support, Caroline believes workplaces can do much more to enable autistic employees to succeed and thrive.

"Unfortunately, autism still carries a strong stigma, and the de-prioritisation of diversity and inclusion initiatives only makes addressing these issues more urgent."

CAROLINE DUNCAN
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Bringing Generations Together: Rethinking Community, Play and Age Discrimination

Dr Linda Jane Shaw's research focuses on transforming public spaces to encourage intergenerational interaction, reduce inequality and tackle ageism, helping to rebuild stronger, fairer communities through inclusive spaces for all ages.

Local communities making safe spaces available to young people to grow, play and connect is challenging financially and socially, especially in disadvantaged areas.

Dr Linda Jane Shaw addresses this problem by reimagining public spaces to encourage intergenerational interaction, reduce inequality and tackle one of the most overlooked forms of discrimination: ageism.

Her project focuses on transforming parks and leisure facilities to become inclusive spaces for all ages. These aren't just upgrades to playgrounds - they are efforts to rebuild community ties and ensure that people from different generations and backgrounds can interact, share experiences and learn from one another. The aim is to challenge the idea that spaces - and society - should be designed by age group, and instead encourage communities to mix, grow and support each other.

Dr Shaw's background in play work - a field that explores the importance of play in children's development - combined with her personal experience caring for a parent with Alzheimer's, led her to explore the value of intergenerational play and its role in healthy aging. Her current research is based on the idea that meaningful interaction between generations can reduce isolation, improve wellbeing and create stronger, fairer communities.

One of the project's early successes took place in a park in Derby, where a diverse community - including East Asian, Eastern European and Roma families - came together to help shape the space. What was once a park divided by age zones became a shared hub, with a café serving as a meeting point for different groups. Features like QR codes in different languages and play areas designed for mixed ages support this more open approach.

The initiative began as part of a programme providing holiday activities for children receiving free school meals but its impact goes far beyond those early aims. It's about giving communities the tools to reconnect, and offering young people and older generations the chance to interact meaningfully in shared, safe spaces.

Dr Shaw's research highlights that poverty, educational outcomes and social exclusion are rarely the result of just one factor. By exploring how ideas around age and play intersect with inequality, she's helping to change how we think about community support. Sustainability, in her view, isn't just about the environment - it's about building communities where different generations share knowledge and support one another. That, she believes, is how real change begins.

"Ageism is one of the last acceptable forms of discrimination. We need spaces - and mindsets - that bring people together, not keep them apart."

DR LINDA SHAW
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Digital Pathways to Living Heritage: Preserving and Amplifying Marginalised Community Voices

Bernardo de La Vega Vinolo is working with grassroots communities in the Global South to co-explore digital avenues that help them digitise and share their cultural heritage on their own terms, boosting visibility, sustainability and local prosperity with minimal external influence.

Grassroots communities in the Global South often face social and structural barriers to digital access due to historical inequalities. These impediments can make them less visible and thus less socially relevant on a local and global scale. Sometimes external organisations attempt to support these groups in their digital transition, but they often take control of the process, thereby developing online materials that don't fully reflect what the communities themselves think is important. As a result, the authentic narratives and living traditions of these places can become invisible or misrepresented.

Bernardo de La Vega Vinolo, a research student in Business and Management, focuses on helping these communities come online in their own way. By collaborating directly with these community-led initiatives, he assists them in sharing their culture and heritage on their own terms in the digital domain. This participatory research approach not only enhances the political and economic visibility of these communities, but also fosters their ability to attract more visitors and support, stimulating local economies without losing control over their own identity and autonomy.

By supporting communities to digitise and manage their heritage more independently, Bernardo's work helps them grow in a more socially sustainable way, reducing reliance on outside organisations. This approach also offers a way to boost local development, while avoiding the environmental and social issues that often come with rapid, outside-led development. The sustainability of social, heritage and environmental practices - both physical and digital - needs to resonate with the territory's aspirations and constraints, as discussions of sustainability and the environment are inherently linked to social security and equity.

"Every environmental problem is in some way a social one, and vice versa. It is impossible to talk about one without the other."

BERNARDO DE LA VEGA VINOLO
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Balancing Farming and Nature: How Invertebrates Hold the Key

Dr Casper Breuker studies how invertebrates adapt to farming pressures, aiming to support sustainable agriculture and protect biodiversity.

One of the biggest challenges the planet faces today, and increasingly recognised by industry, is how to protect nature while still being able to feed a growing population. Agriculture is one of the main causes of biodiversity loss - the disappearance of species and habitats - and this in turn puts economically relevant natural processes at risk. Insects, for example, are essential for pollinating crops, and spiders are essential for pest control, yet their numbers are declining rapidly. Without them, food production and thus the economy could suffer.

At Oxford Brookes University, researchers are exploring how invertebrates - such as insects and spiders - respond to rapid changes in their environment (e.g. in relation to agriculture and rapid climate change). Some species manage to adapt quickly, while others struggle and disappear. The big question is: why?

Dr Casper Breuker is studying how insect mothers produce eggs and how their offspring develop under different environmental pressures, including exposure to pesticides. Casper is looking at how these effects can be passed down through generations, influencing things like behaviour, reproduction and overall development. A new project, which sees his PhD student collaborating with UKCEH and relevant stakeholders, expands the focus to include spiders in agricultural field margins.

By understanding how different species cope, Casper's research is helping to provide evidence to support more sustainable ways of using land, such as schemes that create pesticide-free borders and buffer zones around farmland. These areas protect nearby wild spaces and help invertebrate populations recover and thrive.

The aim is to strike a balance: protecting natural ecosystems, while ensuring we can still produce enough food. It's about working with nature, not against it.

"Nature has always relied on us, but we're only now realising - hopefully not too late - that we rely on it just as much."

DR CASPER BREUKER
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Making Cities Work Better for People and the Planet: Rethinking How We Design and Use Urban Spaces

Dr Esra Kurul's research is helping transform the built environment sector by promoting collaboration, resilience and sustainable practices that actively improve both the planet and people's lives.

The way cities are built and used has a huge impact on the environment and on people's everyday lives, from the air we breathe to the quality of our homes and the spaces between them. Yet the built environment sector has often been slow to respond to growing environmental challenges. That's what Dr Esra Kurul is working to change.

With a background in architecture and experience in both Turkey and the UK, Dr Kurul's research focuses on helping the sector become not just more sustainable, but more thoughtful and resilient. She wants industry to go beyond simply 'doing less harm' and instead find ways to actively repair environmental damage and improve the quality of life for communities.

A big part of this involves changing how people in the sector are trained. Many professionals - from engineers to architects to planners - work in isolation, rarely collaborating across disciplines. Dr Kurul is developing a toolkit to help break down those silos. It's designed to support everyone from students to senior managers to work together on real-world challenges, using a more joined-up and innovative approach.

Dr Kurul believes that research like hers can push the industry forward - not necessarily through a single invention or solution, but by gradually influencing how professionals think, act, and collaborate.

"It's not just about designing greener buildings - it's about rethinking how we live in and between them, and how we work together to shape better cities."

DR ESRA KURUL
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Plastic Solutions: Tackling Microplastics in Our Oceans

Dr Ruth Shaw, Research Fellow in Geography at Oxford Brookes, is confronting one of today's most urgent environmental threats - microplastic pollution.

Microplastics are tiny particles that break down from larger plastic waste. They're now widespread in our oceans and are entering the food chain, affecting marine life and potentially human health.

Dr Shaw's research is focused on developing new methods to detect and track microplastics, so we can better understand how they spread and how to stop them.

Her work could help shape future solutions to protect marine ecosystems, reduce risks to human health, and limit the long-term impact of plastic pollution on the planet.

"Microplastics may be small, but their impact is huge. By understanding how they move through our oceans, we can start to take meaningful action to protect both marine life and human health."

DR RUTH SHAW
Physical Geography Demonstrator, HOPE Impact Research Fellow and Associate Lecturer
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Plant Power: Using Bioengineering to Clean Up Agriculture

Dr Verena Kriechbaumer, Associate Professor in Biotechnology and Plant Sciences at Oxford Brookes, is harnessing the power of plants to tackle major environmental problems.

Her work focuses on bioengineering plants that can reduce pollution and disease in farming. One area of her research is developing plants that can detoxify methane - a major pollutant released by rice paddies around the world. By creating rice plants that essentially clean up after themselves, Dr Kriechbaumer hopes to cut down one of agriculture's most harmful emissions.

She's also engineering plants to produce antimicrobial peptides, helping crops like potatoes fight off diseases such as blight. This could reduce the need for toxic pesticides and make farming more sustainable and resilient.

"By finding ways to help nature heal itself, we can ensure a better future for generations to come."

DR VERENA KRIECHBAUMER
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INNOVATION

The winning Oxford Brookes team. From left to right: Marianna Hansen - Interim Transport Lead, Michele Morley - former Head of Environmental Sustainability, Edward Boyle - Building Optimisation Specialist, Laura Hu - Sustainability Engagement Officer, Gavin Hogdson - Decarbonisation Strategic Lead, and Paul Spencer - Carbon Reduction Manager.

Oxford Brookes Champions a Culture of Sustainability and Research

Oxford Brookes University is committed to sustainability through its operations, teaching, research and engagement, with initiatives focused on Net Zero, energy efficiency, biodiversity, and sustainable transport.

At the heart of this effort is the Environmental Sustainability Team who are responsible for the day-to-day running of environmental sustainability at Oxford Brookes, from biodiversity and waste management to energy efficiency and sustainable transport.

The university has had an Environment Management System (EMS) since 2012. We currently follow the EcoCampus scheme to ensure continual improvement in environmental performance across an organisation, and ensure that the University is on track to reach its Net Zero target by 2040.

Key projects include action on waste reduction, upgrades to smart energy controls, installation of heat pumps, and a significant geothermal installation at Headington Campus which alone has contributed to a 20% carbon reduction.

The Geoexchange system, when combined with operational control improvements, has reduced gas usage by 53%. Solar panels are also being added across university buildings. The wildflower meadows at Marston and Harcourt Hill are also helping local biodiversity flourish in urban settings.

Oxford Brookes also recognises the importance of involving staff and students in meaningful ways. Through programmes like Green Impact, individuals across campus implement practical sustainability actions and are recognised for their efforts. Sustainability knowledge from academic courses is also being put into practice, with some students supporting similar work at other universities.

Engagement with the wider Oxford community is a growing part of our ambition. The Sustainability Expo, which started as a modest event, now brings together students, staff, local charities, and organisations for talks, exhibitions and action. Ongoing partnerships with groups like Oxford Food Hub, Cherwell Collective, and the British Heart Foundation further expand Oxford Brookes impact through food donations, sustainable fashion, and fundraising.

In recognition of this work, Oxford Brookes was named Sustainable Further Education Institution of the Year at the 2024 Oxford Climate Awards, and rose 31 places in the People & Planet University League, now ranked 22nd out of 149 UK universities and awarded ‘First Class’ status.

“From its campus infrastructure to research culture, we are demonstrating that sustainability isn’t just a goal - it’s a shared responsibility and a way of life.”

Sustainability and Innovation at Oxford Brookes: A Focus on Green Practices and Emerging Technologies

At Oxford Brookes University, sustainability and innovation are not treated as separate goals—they're intertwined at every level. From supporting cutting-edge science and tech start-ups to improving the environmental performance of university spaces, a culture of responsible progress is taking root. Across initiatives like the Green Impact challenge and the LEAF programme, and through the work of pioneering businesses in the Enterprise Centre and Bioinnovation Hub, the University is demonstrating how innovation can drive sustainable change.

The Bioinnovation Hub (BiH), works alongside the Oxford Brookes Enterprise Centre (EC), and is home to emerging science and tech ventures, is contributing to Oxford Brookes' sustainability targets by starting their journey on the LEAF (Laboratory Efficiency Assessment Framework) programme. LEAF helps labs reduce energy use, cut waste, and operate more efficiently - ensuring environmental standards rise alongside scientific excellence. For the coming year the EC will also be pursuing their own sustainability journey by taking on the Green Impact challenge.

In addition to improving operations to be more sustainable, many of the businesses supported at the EC are working towards delivering the SDGs - Sun Bear Biofuture is developing sustainable alternatives to palm oil and cocoa butter to cut carbon and prevent habitat loss, while Fermtech has created a low-carbon cocoa alternative, turning a food production side stream into a valuable ingredient with the potential to save vast amounts of carbon dioxide emissions through reducing the need for cocoa cultivation. Oxford Expression Technologies virus expression systems offer scalable vaccine production. Others including Sensible Biotechnology who are developing a scalable platform for mRNA manufacture with a view to reduce production costs and deliver high quality vaccines and therapeutics, and Coding Bio is using AI to develop personalised cancer treatments.

Each of these ventures shows what's possible when innovation and sustainability go hand in hand. Whether it's rethinking how a lab runs or reimagining global food and health systems, Oxford Brookes is proving that local action can power global progress.

"Whether it's rethinking how a lab runs or reimagining global food and health systems, Oxford Brookes is proving that local action can power global progress."

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FUTURE THINKERS

Smart, Targeted Action for a Greener, Healthier Future

Professor Rajat Gupta's research at Oxford Brookes focuses on achieving net zero emissions and climate resilience in buildings while enhancing health and sustainability, particularly for vulnerable communities.

While global goals like net zero and environmental sustainability can feel distant or abstract, Professor Rajat Gupta's work shows how research can bring about real, practical change - especially for communities most at risk from climate change. His research focuses on how buildings and neighbourhoods use energy, and how smarter design, data and technology can improve both health and sustainability outcomes in a warming climate.

The problem is clear: the UK faces a huge challenge in cutting carbon emissions from its buildings - especially older homes. Retrofitting these homes to be more energy efficient is vital, but if done poorly, it can cause overheating, damp and indoor air pollution, particularly affecting vulnerable groups such as older people or those with health conditions.

Professor Gupta, an expert in Sustainable Architecture and Climate Change, is leading several major research projects that tackle this challenge head-on. Altogether, these projects have attracted £20 million in funding from UK Research and Innovation (UKRI), a highly competitive national research funder. Oxford Brookes itself receives £3.7 million from this portfolio - a significant investment in the area of climate change, health and built environment.

At the heart of this work is a £7.4 million project and the UK's National Research Hub on Net Zero, Health and Extreme Heat (HEARTH). Led by Professor Gupta and involving 30 researchers across several universities, HEARTH explores how climate action can be designed to improve health and fairness in society. It will look at how extreme heat affects different communities and create evidence-based solutions that policymakers can implement.

"Our aim is to ensure that climate resilience and net zero go hand in hand," Professor Gupta explains. "We need solutions that protect the most vulnerable and create healthier, fairer places for everyone to live."

Another large project, The Indoor HABItability during the Transition to Net Zero Housing Hub (INHABIT) worth £7.3 million, is tackling the UK's huge retrofit challenge. With 29 million homes needing upgrades to meet net zero targets, INHABIT is examining ways of retrofitting without creating health risks. The focus is on issues like trapped moisture, indoor air quality, and how design choices can affect older residents with respiratory problems.

A third project, ARCADE worth £2 million, focuses specifically on the dangers of overheating for vulnerable populations. It will test how well different housing types protect people from heat, using sensors, simulations and real-life data. The team will work with policymakers to improve future building and housing regulations, with a focus on ageing population.

Professor Gupta's expertise is already informing government thinking. He has been advising the Ministry of Justice on overheating in UK prisons. His recommendations - from installing night-time ventilation systems to tackling overcrowding - were included in the government's official response.

Closer to home, he is leading the Clean Heat Streets project in Oxford. With a £3.35 million grant, this trial is helping 100 households in Rose Hill replace gas boilers with low carbon heat pumps. The programme offers discounted installations and one-to-one support, with the goal of making clean heating accessible to ordinary families. If successful, it could pave the way for a wider rollout across the city.

Beyond these major projects, Professor Gupta's earlier work continues to make a difference. He developed a novel software tool called DECoRuM®, which helps local authorities and communities map how energy is being used across neighbourhoods. By showing where energy is being wasted, the tool enables targeted improvements - from solar panels to insulation. It's been used in Oxford, Bicester, and even adapted for use in India to map energy use at neighbourhood scale.

Professor Gupta's projects are united by a simple but powerful idea: that the net zero transition should improve lives, not just reduce emissions.

"We're not just looking at climate change in theory, we're making sure the move to net zero is done in a way that protects people's health, reduces inequality, and creates a better future for all."

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