

# House of Commons Environmental Audit Committee: Greening the post-COVID Recovery Inquiry

## Written evidence submitted by the Microbiology Society

### Introduction

- The Microbiology Society is a membership charity for scientists interested in microbes, their effects and their practical uses. It is one of the largest microbiology societies in Europe with a worldwide membership based in universities, industry, hospitals, research institutes and schools. Microbiology is the study of all living organisms that are too small to be visible with the naked eye. This includes bacteria, archaea, viruses, fungi, prions, protozoa and algae, collectively known as 'microbes'.
- Our principal goal is to develop, expand and strengthen the networks available to our members so that they can generate new knowledge about microbes and ensure that it is shared with other communities. The impacts from this will drive us towards a world in which the science of microbiology provides maximum benefit to society.
- The Microbiology Society welcomes the opportunity to inform the Committee's timely inquiry. In July 2020, the Microbiology Society held a series of workshops focusing on how microbiology can help to achieve the United Nations Sustainable Development Goals (UN SDGs)<sup>1</sup>. The discussions held during the workshops provided valuable insight into how microbiology is contributing to achieve a more sustainable future and have informed our response to this consultation.

### **Q1: How can any fiscal and economic stimulus packages be aligned with the UK's ambitions on net-zero, biodiversity, the circular economy, and Sustainable Development Goals?**

- The coronavirus pandemic has highlighted the crucial role of microbiology research and innovation in tackling global challenges. However, microbiology is not limited to global health issues and has the power to tackle climate change, biodiversity loss and sustainable development. For example, microbiology is vital to processes such as bioremediation, materials modification, the application of low-energy bioprocessing pathways to solve industrial production problems and the use of genetically modified microbes to produce alternative fuels.

---

<sup>1</sup> Microbiology Society (2020) 'A Sustainable Future' project: <https://microbiologysociety.org/our-work/75th-anniversary-a-sustainable-future.html>

- In order to tackle future global challenges, investment in microbiological research and innovation, in both the short and long term, should be a priority for post-COVID fiscal and economic packages:
  - The Government’s fiscal and economic stimulus packages should ensure sufficient short-term funding for academic researchers who are not involved in the COVID-19 response. University research plays an important role in developing novel technologies that are aligned with the UK’s goals on climate change, biodiversity and sustainable development. Members have expressed concern over the current microbiology funding within universities, highlighting that their funding may not be extended to accommodate disruptions due to COVID-19, which poses a threat to progress in these areas.
  - Ensuring long term microbiological R&D funding in the fiscal and economic stimulus packages is also crucial for greening the post-COVID recovery. The Government’s new ‘Research and Development (R&D) roadmap’<sup>2</sup>, which highlights the need for new funding approaches to ensure a sustainable and long-term approach to funding of scientific research, is encouraging. This will be important to tackle complex global challenges such as climate change, and workshop attendees also raised the importance of long-term funding for ambitious, goal-driven research.

**Q3: In what areas should interventions be targeted to deliver both economic and environmental benefits in the short and long term?**

- The UK should continue to focus on being a world-leader in the field of antimicrobial resistance (AMR). As acknowledged by the Government in its ‘5-year national action plan on AMR’<sup>3</sup> and Lord O’Neill’s AMR review<sup>4</sup>, without action, antimicrobial resistance could lead to cumulative costs of \$100 trillion by 2050. Workshop attendees expressed that antimicrobial resistance is a ‘slow moving pandemic’ and therefore continued investment in infectious diseases will be crucial to safeguard the economy in the longer term.
- Although micro-organisms have been perceived as enemies due to the COVID-19 pandemic, there is now an opportunity to unlock their potential as crucial allies to ‘build back better’. To achieve this, interventions should be targeted in the following two areas:

**Soil health**

- Soil health is vital for maintaining food security, preserving biodiversity and combatting climate change. There are growing concerns about the number of viable

---

<sup>2</sup> UK Government (2020) Research and Development roadmap:  
<https://www.gov.uk/government/publications/uk-research-and-development-roadmap>

<sup>3</sup> UK Government (2019) 5-year action plan for antimicrobial resistance 2019 to 2024:  
<https://www.gov.uk/government/publications/uk-5-year-action-plan-for-antimicrobial-resistance-2019-to-2024>

<sup>4</sup> Review on Antimicrobial Resistance (2016) Tackling drug-resistant infections globally:  
[https://amr-review.org/sites/default/files/160525\\_Final%20paper\\_with%20cover.pdf](https://amr-review.org/sites/default/files/160525_Final%20paper_with%20cover.pdf)

growing cycles remaining in global soil stock. Microbiology plays a key role in securing a future in which healthy and sustainable soils can effectively support agriculture and food security, while preserving our limited land resources<sup>5</sup>.

- Continued technological innovation within the field of soil health, and engagement across a broad range of stakeholders to implement the novel technologies, will be critical to embed sustainable practices in a post-COVID recovery.
- COVID-19 has highlighted the fragility of food production systems and there is now an opportunity to create market demand for sustainably produced food, which could allow farmers to benefit economically from sustainable soil practices, as well as benefit the environment and climate.

### **Circular economy**

- The circular economy is based on the principles of designing out waste and pollution, keeping products and materials in use, and regenerating natural systems. Microbiology is essential for the development of the circular economy, including in the areas of plastic and food waste, and could be harnessed to move away from the throwaway society<sup>6</sup>.
- Workshop attendees highlighted that solutions which enable better management of food and waste already exist and are close to breakthrough. However, the focus should now be on incentivisation of the private sector to invest in the infrastructures needed to bring these technologies to the market.
- COVID-19 has revealed issues with supply chains in certain sectors and this has created a renewed interest from the public in localised production and more sustainable supply chains. Using the momentum of the 'build back better' campaigns, there is an opportunity for policymakers and microbiologists to engage with the public in this area and encourage behavioural change to adopt a more circular economy.

### **Q6: How can the economic recovery stimulus be used to deliver green jobs at a time of potentially high unemployment?**

- Broadening the scope of microbiological research currently funded in the UK and focusing on non-health expertise, within fields like soil health and the circular economy, will help create green jobs during a period of potentially high unemployment, whilst addressing food security and climate change.

---

<sup>5</sup> Microbiology Society (2020) Explainer: Soil Health  
<https://microbiologysociety.org/uploads/assets/f0266831-5df8-438a-bc2bebdd22de9f5f/Soil-Health-Explainer.pdf>

<sup>6</sup> Microbiology Society (2020) Explainer: Circular Economy  
<https://microbiologysociety.org/uploads/assets/67c1114e-9fe2-49f7-bfd446f6ce051bd0/Circular-Economy-explainer.pdf>

- Developing novel technologies that could help build a sustainable agricultural and food supply chain, or reach zero-emissions, requires a whole-systems approach and therefore investment in these technologies within the economic recovery stimulus offers employment opportunities across a wide range of disciplines and sectors.
- Improving soil health provides societal benefits through ecosystem services such as carbon storage and water quality. Similar to man-made infrastructure investments, investments in natural infrastructure could help to deliver high-payment jobs and deliver tangible benefits such as long-term resilience to climate change.
- During our workshops focused on the role of microbiology in achieving the Sustainable Development Goals, we heard views from a range of experts the fields of soil health and the circular economy across the regions and nations of the UK. Focusing the economic recovery stimulus within these areas could create jobs at a local level and align with the Government's 'levelling-up' agenda.

**Q8: In the run up to Conferences of the Parties to UN conventions on climate change and biodiversity next year, how can the UK use its influence, as both host of COP26 and when holding the Presidency of the G7 in 2021, to influence the nature of economic rescue packages around the world**

- The UK should seek to promote and strengthen its position as an international leader in microbiology research. The UK's strengths lie in the breadth of expertise across disciplines and sectors, and stimulating collaboration is vital. Examples of the UK being at the forefront of the international community include:
  - Networks that enable collaborative and interdisciplinary research such as the Networks in Industrial Biotechnology and Bioenergy (BBSRC NIBB)<sup>7</sup> and the Environmental Biotechnology Network (EBnet)<sup>8</sup>.
  - Collaborative research programmes including the 'Resource Recovery from Waste'<sup>9</sup>, which is engaging academia, industry, government and the general public to develop knowledge and tools to reduce pressure on natural resources and create value from waste.

---

<sup>7</sup> Networks in Industrial Biotechnology and Bioenergy:  
<https://bbsrc.ukri.org/research/programmes-networks/research-networks/nibb/>

<sup>8</sup> Environmental Biotechnology Network:  
<https://ebnet.ac.uk/>

<sup>9</sup> Resource recovery from waste:  
<https://rrfw.org.uk/>

- Supporting innovation through organisations like Innovate UK<sup>10</sup>, which has an efficient scheme funding business and research collaborations to accelerate innovation and drive business investment into research and development.
- The UK is a key driver behind international research efforts, particularly through Official Development Assistance (ODA) funding. This contribution has been important to support innovative microbiological research in both soil health and the circular economy. Workshop attendees cited the Global Research Challenge Fund and the Newton Fund as key funders of multinational collaborative projects<sup>11</sup>.
- We encourage the Government to engage further with society on the impacts of economic consumption on global resource depletion, CO<sub>2</sub> emissions and worldwide pollution. Engaging with citizen initiatives such as the Climate Assembly UK<sup>12</sup>, which heard balanced evidence on the choices the UK faces, discussed them, and made recommendations about what the UK should do to become net zero by 2050, will facilitate the COP26 as it will show true commitment to climate change.

---

<sup>10</sup> Innovate UK:

<https://www.gov.uk/government/organisations/innovate-uk>

<sup>11</sup> (a) UKRI, Global Challenges Research Fund <https://www.ukri.org/research/global-challenges-research-fund/>;  
(b) MRC, The Newton Fund <https://www.newtonfund.ac.uk/>

<sup>12</sup> Climate Assembly UK: The path to net zero  
<https://www.climateassembly.uk/>