1 Naoroji Street
London WC1X 0GB
Tel: +44 (0)20 3925 3440
science.policy@rsb.org.uk
www.rsb.org.uk

26th April 2024

Environmental Audit Committee (EAC) enquiry into climate change and security

Dear Committee members,

The Royal Society of Biology (RSB) is a learned society representing a diverse breadth of members and organisations in the life sciences sector[1]. Our mission is to be the unified voice for the bioscience community and to provide impartial evidence-based advice to policymakers. We welcome this important inquiry.

Our key recommendation in response is that the committee consider (and scrutinise Government's integrated action) broadly across the areas of security impacted by climate change, including UK **biological security and food security.** This can be expanded into three key points:

- Threats to UK biosecurity as a result of climate change can pose challenges to both human health and the UK food system, as well as the wider UK environment
- Food security underpins a multitude of factors both on the domestic and international stage, and subsequent food insecurity can lead to serious health and economic consequences, as well as increasing geopolitical tensions
- Treating these issues as an interconnected system of challenges is critical, and innovation, education, and adaption are all essential when developing solutions to these

We elucidate on these points below.

1. Climate change-driven challenges to UK national, human and food security

Biological security relates in part to understanding and preventing the risks posed by pests and diseases. Climate change (and chemical and waste pollution) causes biodiversity loss[2] which in turn increases the risk of infectious disease[3,4,5]. These risks include new emergence or altered prevalence and distribution of known zoonotic diseases affecting human health. Recent H5N1 'spill over' events into mammalian populations, including humans[6], are indicative of the human-animal-climate-environment or 'One Health' nexus.

Climate change can also lead to the expanding host range of many plant pests and diseases, such as *Xylella fastidiosa*[7], which can have a devastating impact on UK biodiversity, as well as the agriculture and horticultural sectors, thereby affecting supply chains in the food system.

Climate change, and biodiversity loss, are major contributing factors to **food insecurity**[8], both at a national and international level. UK food security is at risk in both respects, because it relies on the functioning of the Global Food System involving supply from both national and international (imported) food production[9]. The

[1] A list of RSB Member Organisations is available on our website
[2] Natural History Museum explainer article: 'How are climate change and biodiversity loss linked', published 2022.
[3] IPCC report 'Climate change 2022: Impacts, Adaptation and Vulnerability' p.g. 233
[4] The Royal Society of Biology, 2022: Royal Society of Biology letter in advance of COP15
[5] The Royal Society of Biology, 2023: Response from the Royal Society of Biology (RSB) to the House of Commons Science and Technology Committee inquiry into emerging diseases and learnings from covid-19
[6] New Scientist, 2024: Bird flu confirmed in person who had contact with infected dairy cows
[7] Animal and Plant Health Agency, 2023: Climate change, plants and plant pests
[8] House of Lords Library briefing: 'Impact of climate change and biodiversity loss on food security', published 2022.
[9] The Global Food Security programme, UK Research and Innovation, 2021: The Role of the UK Food System in Meeting Global Agreements: Potential Scenarios

national and international production and supply of crop-based animal feed, fibre (e.g. for textiles), and construction materials is related and likely to be similarly affected by climate change and related stressors. Food insecurity is connected to a multitude of other issues both domestically and internationally, and should be considered in this wider context. Disruption in the supply chains involved in these processes above can have significant consequences including economic and public health impacts, as well as increasing geopolitical tensions and subsequent international security risks. Identifying these points of risk and developing solutions to these should be seen as a key priority.

2. Potential solutions to these challenges

In order to have the largest impact across the widest range of areas for the UK, solutions must be grounded on the fact that **climate change is part of an interconnected system of challenges**, including chemicals and waste pollution and biodiversity loss. Government must employ a pragmatically holistic process, utilising systems thinking and connecting across departments, to tackle these linked issues in tandem.

Just as climate change is a **global challenge** to be remedied through collaborative local, national and international action, so too the UK's domestic status with regard to food security, and biological security, is inherently linked to global challenges and trends. For long-term resilience and security, robust strategies and contingency resourcing for risk mitigation and adaptation at the national level, including for example via border security, must be accompanied by international collaboration and action. United Nations and related independent frameworks, agreements and structures[10],[11],[12] for integrated international collaboration across these challenges and security domains are important for consolidation of evidence base and collaborative direction setting in national policymaking. Such structures also stand to benefit from UK leadership in systems thinking across policymaking, including the integration of **One Health[13]** principles and evidence base, which is imperative.

The education sector has an important role in meeting these targets and helping address the current and future challenges posed by climate change in this context. The Royal Society of Biology's Evolving 5-19 Biology: recommendations and framework for 5-19 biology curricula set's out RSB's vision for future national curriculum and qualifications landscape in a contemporary and durable manner, and including consideration of how biological science is done, how biological scientists work to develop scientific explanations and applications and impacts of biological science in the world as part of seven big questions to frame 5-19 biology curricula, further explores themes within those and sets out expected learning and an exemplification of how this could be organised at 5-11, 11-16 and 16-19[14]. RSB is currently developing documents to sit alongside *Evolving 5-19 Biology* on Sustainability Education and Barriers and solutions to teaching ecology and would be happy to share these with the committee when published.

"Biodiversity and human impacts" forms one of the three main themes in the overarching Big Question "How do organisms live together?" including the importance of biodiversity and the need for good biosecurity practise. RSB's *Evolving 5-19 Biology* sets out expected learning. RSB would recommend the EAC consider utilising Evolving 5-19 Biology and the following expected learning statements in any recommendations on education:
At age 5 – 11: Human actions affect local and global habitats, and the organisms that live there, in both positive and negative ways. Some of our actions affect organisms that we depend on for food and other resources

[10] The UN Sustainable Development Goals
[11] In 2022 G7 Health Ministers endorsed the Quadrapartite One Health Joint Action Plan
[12] The Intergovernmental Panel on Climate Change
[13] World Health Organisation, One Health information page
[14] Royal Society of Biology (2021) *Evolving 5-19 Biology: recommendations framework for 5-19 biology curricula*

At age 11 – 16: Biodiversity can be measured at genetic, specifies and ecosystem level. Human actions affect local and global ecosystems in both positive and negative ways. Biodiversity loss and sustainability affect the security of our supplies of food and other resources.
At age 16 – 19: Biodiversity includes genetic, species and ecosystem diversity, and both biodiversity and factors affecting it can be measured in the field. Effective management of the conflict between the needs of the growing human population and conservation is needed to maintain biodiversity, to help ensure the sustainability of resources and food security.

Rapid adaptation both from a behavioural and policy level standpoint is critical as part of the solution to these challenges. Ambitious policy frameworks are required to encourage and facilitate the behavioural change needed to address the wider issue of climate change and the aforementioned security challenges associated with it. Tackling the issue of consumption as a driving effect of climate change and the associated risks would help begin addressing these challenges, as well as bringing potential economic and environmental benefits.

The following are also important in the development of solutions to the challenges described: **adaptive and pro-innovation regulatory pathways** must enable innovation while being responsive to any emerging risks and aligned with protection goals (e.g. the safe use of genetic technologies in developing climate change resilient crops); **fit for purpose funding frameworks for research and development** should support a culture of high standards in collaboration, impact, excellence and integrity, for example to provide the One Health evidence base upon which effective policies can be built on; **developing and maintaining standards for an aptly skilled workforce** across relevant sectors via education, continuing professional development, professionalisation and accreditation is key e.g. the RSB's professional registers incorporate toxicology and plant health, and a new biorisk and bio-containment professionals register launching with relevant partners in June 2024[15]; **citizen's views and choices must be integrated in decision-making** via consultation, dialogue, openness and transparency, to engender broad societal trust, tackle the spread of disinformation, and support successful risk mitigation strategies[16].

We were pleased to see the UK Biological Security Strategy[17] recognising these interdependencies and international agreements, and embedding a 'One Health and climate focused approach' - also following RSB's recommendations[18]. The RSB suggests **Government is queried in further detail on how it plans to fully integrate** climate change adaptation and mitigation-related strategies with policymaking focused on reversing biodiversity loss and chemical and waste pollution (such as the 25 year Environment Plan[19]), and with the UK Biological Security Strategy and food security-related strategies[20]. The integration of policymaking where there is a bearing on related workforce, education and R&D sectors, such as UK Science and Technology Framework[21], will also be important to map and scrutinise for gaps and effectiveness. We would be pleased to discuss any of these points in further detail with the Committee.

[15] Royal Society of Biology (2023): Professional Registers
[16] The Royal Society of Biology, 2023: Response from the Royal Society of Biology (RSB) to the House of Commons Science and Technology Committee inquiry into emerging diseases and learnings from covid-19
[17] UK Biological Security Strategy, published 2023
[18] The Royal Society of Biology, 2022: Response from the Royal Society of Biology (RSB) to the call for evidence on the UK's Biological Security Strategy
[19] The 25 Year Environment Plan, published 2018
[20] Government Food Strategy, published 2021
[21] The UK Science and Technology Framework, published 2023

Yours sincerely,

Dr Mark Downs CBiol CSci FRSB
Chief Executive
Royal Society of Biology