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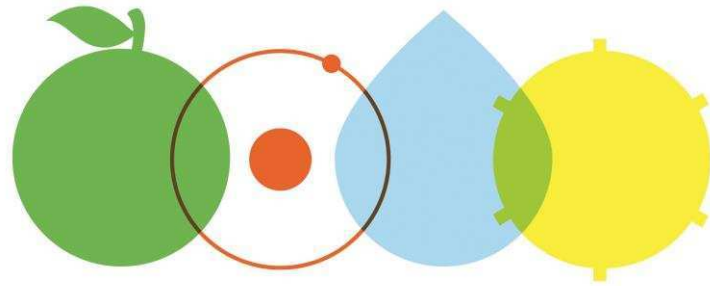
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THE NEXUS NETWORK
new connections in food, energy, water and the environment
An ESRC investment

**Nexus Network - Defra Fellowship report:
Nexus approaches at Defra**

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Summary

- Nexus approaches are relevant to the challenges facing Defra as its remit covers the management of inter-relations and trade-offs between food, water, energy and environment.
- Defra already uses a variety of approaches in its evidence, policy and 'place based' delivery activities to tackle issues associated with inter-relations and trade-offs between domains.
- Defra's current approach to evidence planning, bringing together Defra's organisations, has potential to further facilitate work across nexus issues.

Introduction:

In 2014 the Economic and Social Science Research Council began a 3-year programme “The Nexus Network” to foster debate, innovative research and practical collaborations across the linked ‘nexus’ domains of food, energy, water and the environment. The work of the programme to date has included reflection on the circular economy, governance of nexus challenges, nexus research methodologies, and other issues of relevance to policymakers.

This fellowship-led study focused on how the nexus domains are currently being considered within Defra and where there are opportunities for furthering cross-domain dialogue and action.

The nexus approach and its relevance to Defra

The ‘nexus approach’ is a way to frame the challenges in the inter-connected domains of food, water, energy and environment. It highlights the interdependencies between these systems and the natural resources that underpin them. The aim of this approach is to manage trade-offs and maximise co-benefits and it is gaining currency in policy and academic circles.

The nexus approach is potentially highly relevant to Defra both in informing the evidence gathering programmes and in contributing to policy development and governance strategies. At Defra, working across domains means not only crossing ‘empirical’ domains, but also organisational domains, within the core Department, within the Defra organisations, and across Whitehall.

The Department’s priorities of the UK leading the world in food and farming, protecting the country from floods and animal and plant diseases, improving the environment, and championing the countryside and improving rural services, all highlight the need for applying nexus perspectives.

Existing analytical tools and frameworks embedded into policy making

- **Impact assessments** are a key decision support tool which have the potential to include nexus-style approaches. Impact assessments are used to identify the environmental, social and economic impacts of a policy, and thus draw attention to the inter-relations between different policy areas. As a result impact assessments are a powerful tool for ensuring the cumulative impacts of the nexus domains on policies are taken into account.
- The **ecosystem services approach** is a framework that helps to bring the natural environment into focus throughout the policy making process; to approach the natural environment as a system; to consider the spatial scale of policy interactions with the natural environment and to interact with the people involved in supplying and receiving ecosystem services and benefits. Carrying out economic valuation of the ecosystem services is currently an important

part of this approach, which is being increasingly incorporated into a range of policy work at Defra.

- The **natural capital framework** has been explored by the Natural Capital Committee since 2011. The language of natural capital has had a strong impact within the Department. Work is currently under way to operationalise natural capital as an analytical and decision support framework for Defra and other governmental and private institutions through the inclusion of natural capital stocks in national accounting. This will allow the Department to better highlight the inter-dependencies between different natural resource domains and the associated human activities.

Defra evidence base – examples of mainstreaming the nexus into evidence programmes

- The Global Food Security programme is a BBSRC-led multi-organisation research programme co-funded by Defra to address the challenge of ensuring global food security through integrated and innovative approaches.
- The Joint Water Evidence Group brings together land and water evidence teams from Defra, the Environment Agency, Natural England and the Forestry Commission (England), to improve work on topics of common interest by making better use of the available evidence in land and water management.
- The Sustainable Intensification Platform is a multi-partner research platform funded by Defra to explore the opportunities and risks for sustainable intensification, from a range of perspectives and at a range of scales across England and Wales.
- Defra evidence teams are mainstreaming nexus thinking as part of their evidence planning processes. Evidence planning needs to be highly collaborative in working across sectors, Defra organisations, and their teams. The evidence priorities which have been identified by evidence teams in the recent Evidence Action Plans articulate a nexus perspective, in that they are problem-oriented and cross the domains of food, water, energy and environment. *Examples of this include:*
 - The **Countryside and Natural Capital evidence team** use the natural capital framework to identify key evidence needs around the inter-dependencies between the different natural resource domains and the associated human activities. They also highlight the need to better understand the potential of decentralised and localised approaches to natural capital governance, an issue to which the nexus approach is potentially relevant.
 - The **Food and Farming evidence team** builds on the existing work of the Sustainable Intensification Platform to identify how to

balance/optimize trade-offs between productivity and biodiversity at farm scale, a key evidence need.

- The **Flood and Coastal Erosion Risk Management evidence team** focuses on a better understanding of the inter-relations between water management and other human and natural systems on flood prevention, and highlights the importance of working with communities to help them manage these inter-relations on the ground and respond to risks.

Delivery Activities – examples of implementing nexus approaches

The Nexus perspectives are not just centred on policy/strategy formulation and the underpinning evidence. Operational delivery plays a pivotal role in implementing nexus based approaches. *Examples include:*

- The **catchment-based approach** is derived from the EU Water Framework Directive and highlights the inter-relations between ecological processes and human activity at a local scale. It seeks to bring stakeholders together to deliver locally agreed strategies to deliver good water status in the context of wider nexus challenges. Addressing issues within a catchment requires collaborative action and is best supported through participative decision making.
Community partnerships that bring local knowledge and expertise, are an example of this, and over 100 partnerships are active across the Water Framework Directive catchments across England, including those that border with Wales. In these partnerships, groups and individuals with different interests in land and water work together to identify issues, agree what should be done and put this into practice.
- **Local nature partnerships** are a delivery mechanism to bring together local stakeholders to assess and address environmental conservation and biodiversity priorities, and seek to balance trade-offs and inter-dependencies between different resource domains on a local scale.
- **Nature improvement areas** were established to create joined up and resilient ecological networks at a landscape scale. They are run by partnerships of local authorities, local communities and landowners, the private sector and conservation organisations.

Skills and capabilities for utilising nexus approaches at Defra

There are both institutional and cultural drivers within Defra which seek to ensure the cross-sectorial and collaborative working, characteristic of nexus approaches.

Achieving good nexus working by individuals in the Department requires expertise of one's policy area, knowledge of other relevant policy areas, and good working relations with colleagues in relevant policy teams and with external stakeholders.

This is supported by the Civil Service competency "Collaborating and Partnering". Developing this competency by Defra civil servants will assist in the creation of joint evidence and policy programmes and cultivate further membership in professional networks.

The 'so what's' – issues and exploratory questions for further consideration

- The debate about the nexus is helpful as it raises awareness about a set of important sustainability challenges and the trade-offs and interdependencies between them. Acknowledging interdependencies and complexity is a necessary first step, but not enough to provide solutions to managing the interdependencies, and the challenge for those working on nexus approaches is how to move from abstract concepts to practical action. Further research, knowledge exchange and advice from the academic community is required to clarify how the nexus approach significantly differs from existing systems-level approaches (e.g. an ecosystems approach), and to identify where it can add value for policymakers.
- Through Defra's engagement with external partners (including academia), there is may be potential to build researcher-led interdisciplinary coalitions for nexus thinking in relation to policy relevant issues. Whilst the practicalities of this would need to be worked out, identifying relevant expertise from across the food, water, energy and environment domains and bringing them together in a virtual hub-type structure could help in the facilitation of nexus approaches to evidence gathering. This presents an opportunity to draw on the Nexus Network's affiliated academic groups to bring the right coalitions together in an interdisciplinary fashion.
- The nexus perspective would suggest that there may be potential to further integrate aspects/issues identified in the Evidence Action Plans by examining inter-relations and trade-offs between the evidence needs identified in different EAPs. This cross-cutting perspective could deliver additional efficiencies and ensure a systemic approach across policy areas. How may this integration be best carried out?
- Defra sponsors a number of place-based delivery initiatives relevant to the governance of nexus challenges, such as catchment based management. Creating dialogue and knowledge exchange between these initiatives could

offer valuable evidence about managing the interdependencies between the nexus domains. This would help identify valuable new evidence and insights about the type of governance arrangements that exist to manage the nexus of food, water, energy and environment and best practice on the ground. How could such ongoing learning from existing initiatives be best carried out?

- What could be done to further support collaborative and proactive behaviour of individual civil servants and teams within Defra in meeting nexus challenges? When opportunities present themselves, appropriate ways of providing additional institutional support for the development of the skills and behaviours which enable cooperative and cross-domain working could be explored.