



Water-energy-food interdependencies: implications for Local Authorities



W E F W E B S

- We find that Local Authorities have a key role to play given their cross-cutting remits around waste, planning, housing and transport.
- Leveraging this for better water-energy-food outcomes can be achieved with attention to capacity building among staff, system mapping to identify interconnections, and working to convene actors who collect data on water, energy and food flows.

Summary

Increasingly referred to as the 'nexus', interdependencies between the water, energy and food (WEF) systems are multiple. The increasing pressure on all these systems has been described as the 'perfect storm'; stresses and shocks in one system have potential knock-on effects on the others, with implications for life and its quality. However, we are yet to fully understand the quantity and nature of interdependencies between water, energy and food systems, particularly at sub-national levels. A new multi-disciplinary study – WEFWEBS – has sought to explore, map and measure these relationships at multiple scales and in different places across the UK.

Local Authorities can play a critical role in building awareness of the water-energy-food nexus regionally, and developing capacity and resilience to manage likely stresses and strains.

Introduction

There is increasing pressure on WEF systems locally, nationally and globally due to a range of factors. Broad scale this includes: increasing population pressure and associated demands for energy, water and food; water pollution; soil productivity losses; climate change and greenhouse gas emissions targets; shifting trade priorities. More local to the UK and its regions currently are rising levels of poverty, stagnating wages and rising prices, all of which mean that achieving food, energy and water security are a day to day concern for some. It is critical we build 'nexus' awareness and resilience in response to these pressures.

While pressures have been felt more keenly in other countries (e.g. Rasul and Sharma 2015), and can be more easily characterised at a national or international scale, there is still much to understand about how WEF interdependencies operate and are experienced at the regional to very local level. This briefing communicates some key findings from a research project centred on mapping the WEF nexus, and engaging stakeholders in a learning journey on how water, energy and food interconnect.

Approach and results:

WEFWEB project was initiated in October 2015, bringing together researchers from a range of disciplines and institutions (see logos). Research has been undertaken at the household, region and sector levels. The nexus was approached through four means:

- Data – what data is available to describe and understand the nexus at different spatial resolutions?
- Mapping – how can we map the nexus, and is this a useful method for understanding interconnections?
- Sensing Systems – can we use cutting edge technology to measure WEF flows?
- Experiences and perceptions – how do different people understand and view the ‘nexus’?

Four workshops were held – in Oxford, in the Tamar Valley, in London with infrastructure organisations, and with British wine producers – in which 77 stakeholders engaged in a process of characterising and mapping the nexus as they saw it.

This project found that what constitutes WEF interconnections is context and community dependent. The diagrams on page 3 show how these interconnections were conceived of across different places and industries. Despite variation, there were also some commonalities such as: the role of climate change policy and impacts; inequality and poverty; data availability; the importance of coordination bodies.

Our research found stakeholders working in and around the nexus see Local Authorities as key operators in this area, providing a chance for Local Authorities to take a leadership and brokering role in building awareness and resilience across WEF systems locally and regionally. Local Authorities have remits that influence nexus interdependencies – such as through housing and planning, waste management, transport, urban green spaces, and business support – and work in partnership with, and draw revenue from, other organisations who influence and are influenced by food, energy and water issues.

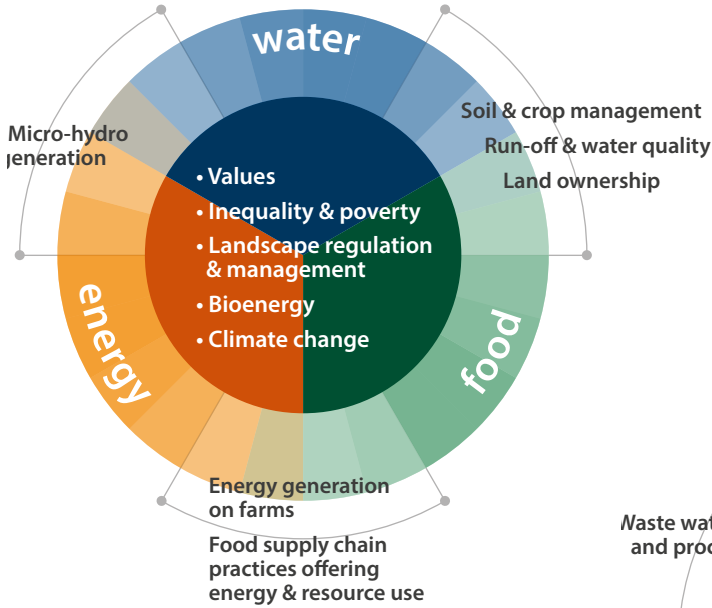
Key findings from our research suggest that the nexus is ideally managed on an area basis, rather than sector by sector. This puts local authorities at the forefront of building capacity and resilience around the WEF nexus. However, challenges currently exist in engaging Local Authorities around nexus issues. Our research points to some areas where this could be improved.

Conclusions:

Key findings from the project that have particular significance for Local Authorities include:

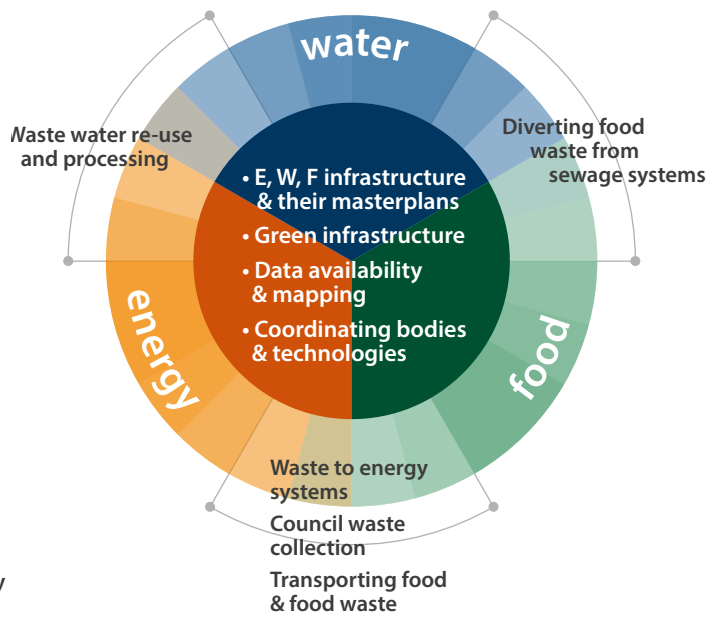
- Interactions between WEF systems are diverse, multiple and understood differently by different people. This has implications for the skills needed by professionals in your organisation working across the WEF nexus, and for the means of communication and language used to do so.

Tamar Valley

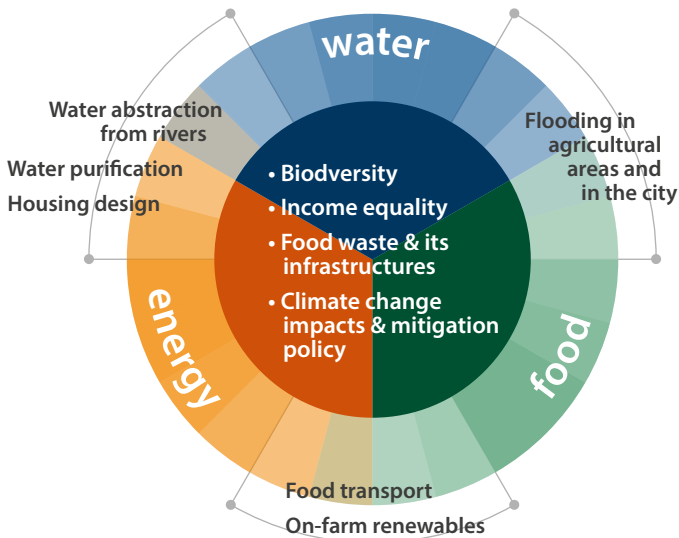


Water-Energy-Food interconnections as conceived of across four area / industry workshops

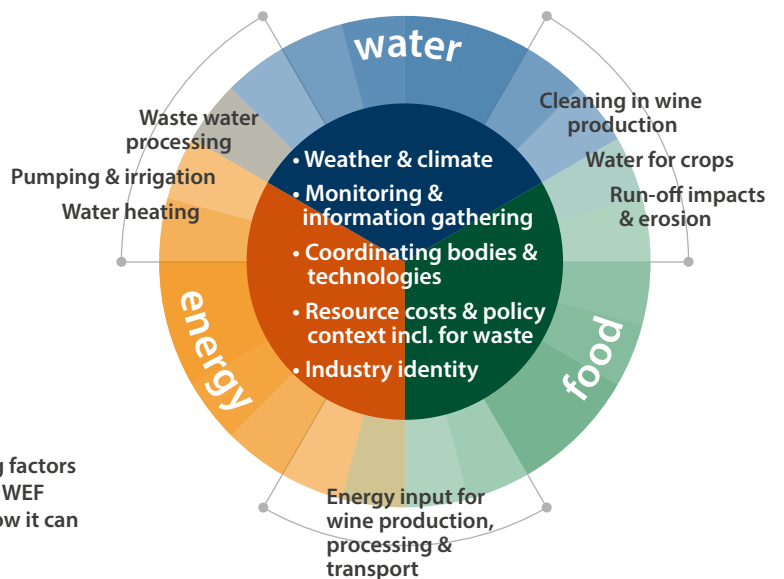
London



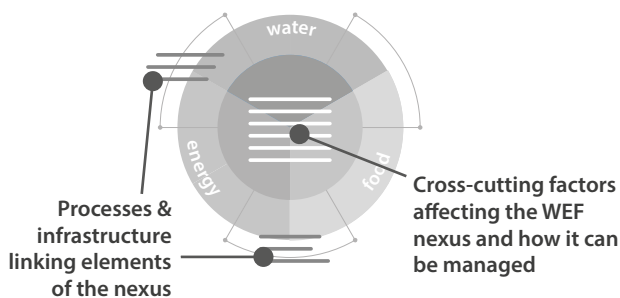
Oxford



English wine



Key



- Stakeholders struggle to engage local authorities in ‘nexus’ issues. This was perceived to be caused by a high turnover of staff, siloed departmental structures, and a lack of accountability and cross-departmental working and knowledge.
- Accessible and compatible data on the nexus is lacking. Data across the W, E and F sectors are captured by companies, environmental agencies and individuals, but this is often sensitive or proprietary information.

Implications and recommendations:

- The concept of the WEF nexus provides an important opportunity to build local governance capacity to support resilience, climate transitions and sustainable growth. It creates a useful means through which to bring people together and to support the development of capabilities towards these ends.
- Investment in human resources around the W, E, F systems have been focussed on people with expertise in ‘hard’ engineering, environmental science or economic disciplines. Our research strongly supports the need to augment this with investment in ‘soft systems’ capacity. That is people who are experienced in communicating in contexts of complexity and across sectors and knowledge fields, who understand the implications of how problems are framed, conflict resolution, multi-stakeholder partnerships, reflective practice and an ability to understand and use multiple methods of enquiry or research.
- Developing processes and resources to mitigate against a high turn-over of staff in WEF nexus areas and enhance accountability on cross-resource working would be highly beneficial.
- Mapping areas of conflict within local government across the W, E, F remits would be helpful to develop self-awareness and begin the process of streamlining policy and process.
- Local authorities, as area-based governing bodies, can be a key actor in facilitating more access to important resource-management data. Mapping data resources on local WEF related areas, exploring cross-compatibility (e.g. common denominators such as by area/region/household and with equal timeframes) and making them open access where possible is the basis of informed action on the nexus. Mapping institutions that are stewards of data, and involving them in WEF analyses, would aid in this process.



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