

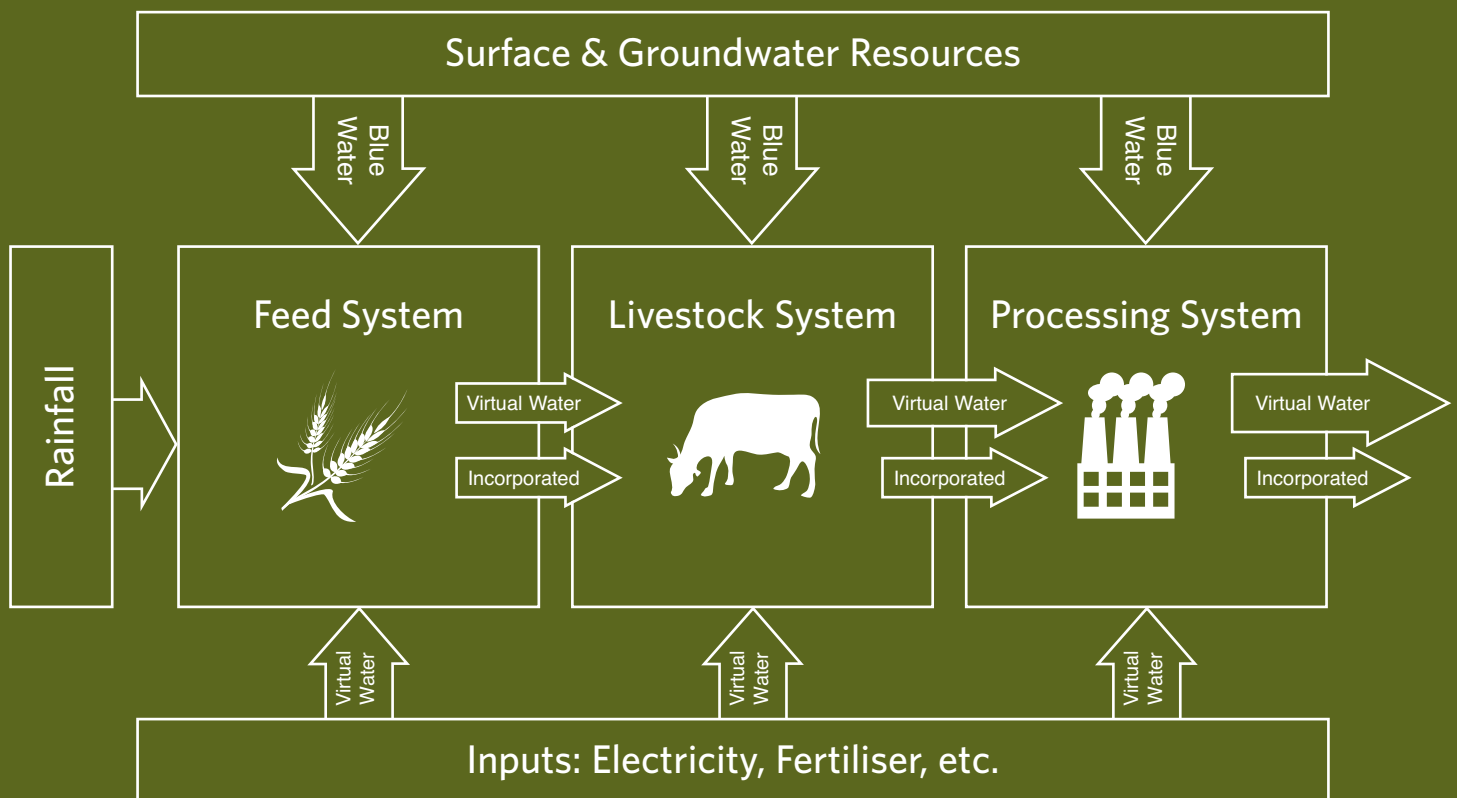
## How does the UK rely on water in other countries to produce our food?

**The food that we import to the UK is dependent upon, and vulnerable to, pressures on global water supplies, with implications for policymakers and businesses.**



Photo by Tim Hess: Irrigated sugar cane production on the slopes of Mount Kilimanjaro, Tanzania.

Our dependence on overseas water resources depends on what we eat, where it comes from, and how it was produced. Over the last 30 years, households in the UK are eating less fresh potato and more rice and pasta. This has increased the amount of “blue” water (that is, water withdrawn from surface and groundwater resources) that it takes to feed us and increased reliance on water resources in the countries from which we import food. Eating more fresh fruit and vegetables, for example, may increase our reliance on water resources in already water-stressed places like Spain and South Africa.



## How much water do we eat?

The water that has been consumed over the life of a product (but is not physically present in the final product) is often called “virtual” water.

**It takes an average of 2,400 litres of water per day to feed each person in the UK. This is because:**

- Everything that we eat contains water – for example, a portion of fresh potatoes contains about 0.15 litres of

water – but much greater volumes of water are used by plants during their life. It takes 40 litres to grow enough potatoes for a portion.

- Smaller amounts of water are used to manufacture inputs (eg fertiliser and pesticides) and to process foods.
- For producing meat, the virtual water includes water used to grow the feed; for sanitation and drinking; and for processing. It takes 7,000 litres to produce a typical British beef steak.

## Why does this matter?

### **The water that goes into producing our food comes from different sources:**

- Most of the food consumed in the UK is from rain-fed agriculture. So for example, 84% of the water required to produce a British beef steak is rainfall used by fodder crops. If that rainfall was not used for growing food it would be used by some other vegetation and would not be available for other users (like domestic or industrial water supply) or to support the aquatic environment. We can consider this water (“green” water) to be less important.
- 7% of the water that is used to produce food for the UK (160 litres/person/day) is water that has been withdrawn from surface and groundwater water resources (“blue” water) for irrigation, animal production and food processing. The users of this water are in competition with other water uses. So, for example, the more water that is used for irrigating crops, the less remains to support the aquatic environment or for domestic and industrial use.
- Globally, about 70% of the world’s fresh-water withdrawals are used for agriculture.

## Where is most water used?

### **The UK relies on water resources in water-stressed regions of the world for its food supply:**

- Two-thirds of the “blue” water used to produce food for the UK is associated with food imports.
- The largest volumes of “blue” water are associated with imported food such as rice, fruits, vegetables and sugar and many of these foods come from water-stressed regions of the world, such as Spain, South Africa, northern India, Pakistan, Israel, Egypt, Australia and parts of the USA.
- In many of the water-stressed regions where our food is produced total water withdrawals exceed environmentally sustainable rates.

## What are the risks we face?

**Secure supplies of water are critical to meeting reliable production and the quality requirements of food but are at risk from physical water shortage (eg drought) or the loss of the legal right to withdraw water.**

### **The competition for scarce water resources in the countries from which we source our food imports will increase because:**

- Population growth means that there will be increasing local demand for water.
- Increased environmental responsibility means that greater volumes of water are being reserved to maintain environmental flows.
- Growing populations and changing diets in source locations and other importing countries mean that there will be increasing demand for water-intensive foods.
- Climate and environmental change may exacerbate water scarcity and drought in the locations from which we import water-intensive foods.

## What do businesses and policymakers need to do?

### Businesses need to:

- Be aware that the UK food supply chain is vulnerable to risks (such as drought) in countries which are already water-stressed and this risk is likely to increase in the future and has implications for the choice and diversity of sourcing locations.
- Diversify the sourcing of water-intensive foods to reduce the reliance on a few, water-stressed locations.
- Understand supply chains of crops imported from different countries and localities in more detail and work with supply chains in high-risk areas to encourage responsible water use and increase resilience to water-related risks at grower level. For example, by supporting training in irrigation scheduling, irrigation system management and promoting water conservation techniques. In many of the water-stressed sourcing locations, water productivity (ie yield per m<sup>3</sup>) is below global average due to low yields and there is scope to promote good husbandry and improved varieties to reduce the water consumption per unit of output.
- Engage in catchment-based water stewardship initiatives, working with international and local businesses, local water managers and NGOs, to support better water-governance in water-stressed source locations.

### UK policymakers need to:

- Be aware that the UK diet puts pressure on scarce water resources in other countries and that our food consumption may be exacerbating water scarcity in those places (“importing food and exporting drought”).
- Ensure healthy eating policies are integrated with environmental sustainability in source locations to avoid unintended consequences.
- Integrate UK food policy, environmental sustainability and overseas development objectives. Although it might seem attractive to discourage sourcing food from higher water-risk locations, abandoning suppliers is unlikely to solve local water resource problems. Generally, exports to the UK are a small proportion of total production and loss of foreign exchange income may have negative local employment and livelihood impacts.

## Further information

**This note was written by Tim Hess, Associate Professor, Water Management Cranfield Water Science Institute, drawing on research by Cranfield University, The Global Food Security programme and the Water Footprint Network.**

### Useful resources:

The Nexus Network: [www.thenexusnetwork.org](http://www.thenexusnetwork.org)

The UK Water Partnership: <http://theukwaterpartnership.org/>

Chatterton, J., Hess, T.M. and Williams, A. (2010) The Water Footprint of English Beef and Lamb Production. EBLEX.

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Hess, T.M., Lankford, B., Lillywhite, R., Cooper, R., Challinor, A., Sutton, P., Brown, C., Meacham, T. and Benton, T. (2015). Water Use in our Food Imports. Farming and Water Report 3. Global Food Security programme. <http://www.foodsecurity.ac.uk/assets/pdfs/water-used-in-imports-report.pdf>.

Hoekstra, A.Y. and Mekonnen, M.M. (2016) Imported water risk: the case of the UK. Environmental Research Letters.

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