

Responsible innovation key to smart farming

Responsible innovation, that considers the wider impacts on society, is key to smart farming, according to academics at the University of East Anglia (UEA).

Agriculture is undergoing a technology revolution, supported by policy-makers around the world. While smart technologies will play an important role in achieving improved productivity and greater eco-efficiency, critics have suggested that consideration of the social impacts is being side-lined.

In a new journal article, Dr David Rose and Dr Jason Chilvers, from UEA's School of Environmental Sciences, argue that the concept of responsible innovation should underpin the so-called fourth agricultural revolution, ensuring that innovations also provide social benefits and address potentially negative side-effects.

Each of the previous revolutions was radical at the time - the first representing a transition from hunting and gathering to settled agriculture, the second relating to the British Agricultural Revolution in the 18th century, and the third to post-war productivity increases, associated with mechanisation and the Green Revolution, in the developing world.

The current 'agri-tech' developments come at a time when the UK government has provided £90 million of public money to transform food production in order to be at the forefront of global advanced sustainable agriculture.

Many other countries are also prioritising smart agri-tech.

This, combined with private investment from organisations, including IBM, Barclays, and Microsoft, means that 'Agriculture 4.0' is underway, with technologies such as Artificial Intelligence (AI) and robotics increasingly being used in farming.

Writing in *Frontiers in Sustainable Food Systems*, Dr Rose, a lecturer in Human Geography, and Dr Chilvers warn though that agri-tech could also have side-effects, bringing potential environmental, ethical, and social costs.

"In light of controversial agri-tech precedents, it is beyond doubt that smart farming is going to cause similar controversy. Robotics and AI could cause job losses or change the nature of farming, in ways that are undesirable to some farmers. Others might be left behind by technological advancement, while wider society might not like how food is being produced," said Dr Rose.

"We therefore encourage policy-makers, funders, technology companies and researchers to consider the views of both farming communities and wider society. We advocate that this new agricultural tech revolution, particularly the areas funded by public money, should be responsible, considering the winners, but particularly the potential losers of change.

Agriculture 4.0: Broadening responsible Innovation in an Era of Smart Farming, David Rose, Jason Chilvers, is published in *Frontiers in Sustainable Food Systems*.