LAND USE FUTURES

GLOBAL FOOD AND LAND USE TRANSITIONS

Harnessing the digital revolution

The digital revolution is here. Sensor, drone, satellite and other remote sensing technologies combined with improved modelling and analytics, artificial intelligence, and machine learning are rapidly developing on a global scale. This is providing increasingly high resolution, real-time and accurate data. These advances are enabling the food and land use system to more affordably and easily access useful price, climate, emissions, environmental, ethical and other data to inform decision making.

Digital technologies and big data can support each of the other transitions, offering opportunities for:

- Farmers and other entrepreneurs to create new digitally-enabled triple bottom line business models and connect in new ways with consumers;

- Innovators to develop the technologies and tools to support these business models;

- Land managers to make better land management and production decisions;

- Food and fibre companies, banks and investors to better account for the value of natural capital and improve transparency of supply chains;

- Citizens to make more informed choices about the health and sustainability of food and other products; and

- Government to better understand the social and environmental dimensions of food and land use and make more informed policy decisions.

In order to maximise these opportunities, it is important that global technology developments are harnessed to improve transparency of environmental and social impacts through the supply chain. This will better align food and land use system incentives towards the maximisation of economic, social and environmental objectives.

Broad and open access to digital technologies and reliable data, as well as wider digital literacy and engagement to ensure all stakeholders are equipped to interpret, utilise and protect this data, are also needed. This will ensure the digital revolution has wide reach and is not monopolised by a small number of players, restricting new entrants or stifling innovation.

AUSTRALIAN CONTEXT

The responsible investment market is growing, but environmental and social conditions and impacts remain largely hidden through Australia's food and land use value chain

- The Australian market for responsible investments – those that deliver positive social or environmental impact alongside a financial return – has tripled over the past two years from $5.7 billion to $19.9 billion[1].

- The Taskforce on Climate-related Financial Disclosures has increased visibility of climate risks, but broader natural capital and environmental impacts are not routinely incorporated into key financial decisions such as lending, property valuation or insurance[2].

- Superannuation funds – often first movers on responsible investment – are not highly invested in the Australian agriculture sector[3], presenting both a barrier and an opportunity.

Australia has large digital opportunities and a solid innovation system upon which to build

- Digital agriculture and digitally-enabled supply chain integrity identified as two of eight high priority digital innovation opportunities for Australia[4].

- Australia has good research sector and private sector capability to collect economic, social and environmental data relating to the food and land use system and translate this into accessible information products, e.g. Digital Agriculture Services, Digital Earth Australia, the Terrestrial Ecosystem Research Network (TERN) and the Soil and Landscape Grid of Australia.

- However Australia significantly lags the US, Israel and Canada when it comes to early stage investment in agtech, including digital technologies, e.g. US per capita investment in agtech is 50 times greater than Australian investment[5].

Australia faces unique challenges in securing broad access to digital technologies

- Australia's large land mass and low population density make it expensive to roll out high quality digital infrastructure, especially in rural, regional and remote areas[6].

- Mobile coverage on farms is often poor[7], and internet is often slower, more costly, and less reliable than for overseas competitors[8].

- Many producers do not see a clear value proposition for increased sharing of data on natural capital and environmental and social impacts[9], and there are significant concerns about data privacy and control, utilisation of data in ways that do not provide benefits to farmers[10].

- Digital literacy[11] and availability of data analytics skills[12] have also been identified as barriers to adoption of digital technologies.
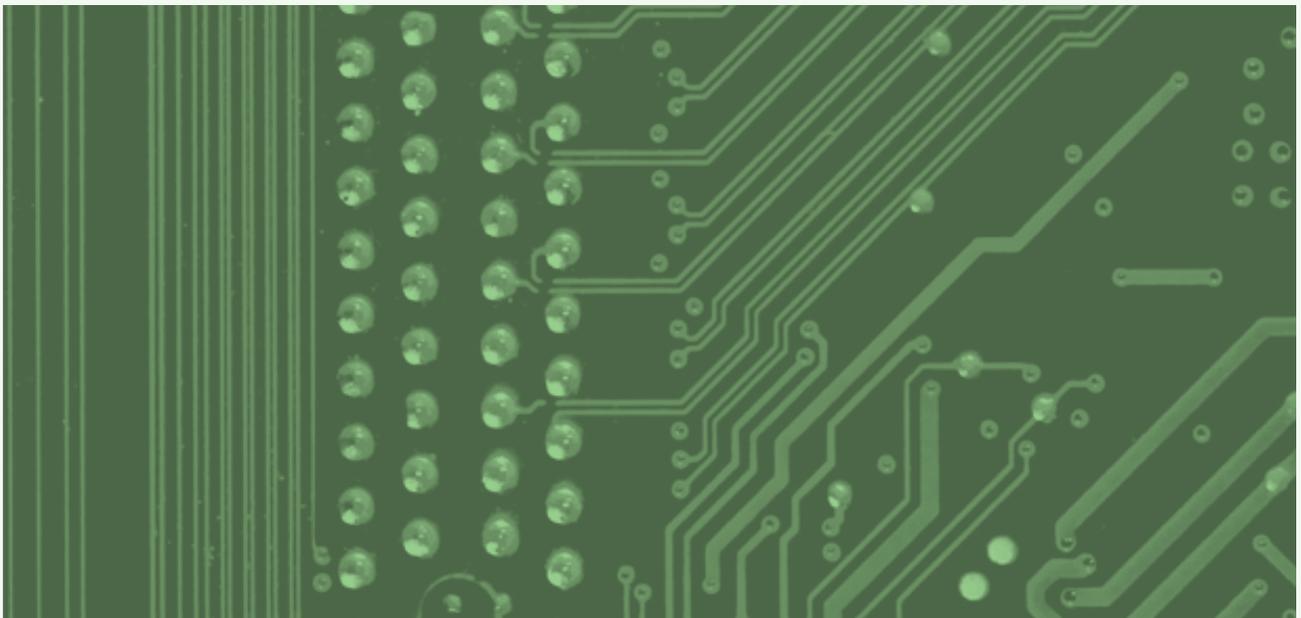
CURRENT STATE OF PLAY

Key action areas[i] for harnessing the digital revolution include:

- **GOVERNMENTS** establish the governance foundations for:

  – Open access to public sector data on food and land use.

  – Updating competition rules (e.g. Australian Competition and Consumer Act) and policies to account for big data and artificial intelligence (AI).

  – Holistic regulation of product labelling and marketing that accounts for environmental and social issues and impacts.

  – Minimum standards for chain-of-custody certification for unprocessed food products and commodities.

  – Open source communities in key areas of research to minimise risk of IP lock in by few companies.

- **INVESTORS, INSURERS AND LENDERS** implement transparency and sustainability guidelines in investment, lending, insurance and other business decisions; support and help develop monitoring, reporting, and evaluation standards for social and environmental impacts; support the development of standardised and auditable disclosure standards for major enterprise risks and support the development of social and environmental benchmarks for agricultural segments.

- **FOOD COMPANIES AND RETAILERS** require suppliers to provide chain-of-custody information that is sufficiently granular to track poor practice, support government efforts in labelling schemes, and better use consumer data to drive growth of healthier food categories.

- **NON-GOVERNMENT ORGANISATIONS** establish real-time platforms for transparency and encourage accountability for governments and the private sector.

The table below outlines the current state-of-play for each action area, including major current and proposed initiatives.

KEY ACTION AREA	PROGRESS TO DATE
GOVERNMENTS ESTABLISH THE GOVERNANCE FOUNDATIONS	• A number of national-scale public datasets provide open access to granular data on land condition, use and land use change, e.g. TERN[13], Digital Earth Australia[14], Soil and Landscape Grid of Australia[15]. • Industry groups have called for the development of better policies and codes for management and ownership of farm data, potentially led by industry rather than government[16]. • Some data management policies and codes have already been developed and implemented on a voluntary basis (e.g. NFF Farm Data Code[17], Food Agility Best Practice Data Policy[18]). • The Cotton Research and Development Corporation (CRDC) has called for a strategic plan for national agriculture data infrastructure investment[19]. • The Commonwealth government has established a national blockchain roadmap[20]. • Some Rural Research and Development Corporations (RDCs) have done work on digital innovation e.g. CRDC Digital Strategy[21], MLA Value Chain Digital Strategy[22].

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i   Based on the Growing Better report.

INVESTORS LEAD IMPLEMENTATION OF TRANSPARENCY AND SUSTAINABILITY INVESTMENT GUIDELINES	• A number of Australian responsible and ethical investment organisations are working on or introducing stronger investment guidelines, particularly around climate disclosure on the back of the TCFD[ii23]. These include: – The Investor Group on Climate Change, whose current strategy asks members to ensure they have climate strategies in place and are TCFD compliant[24]. – The Australian Sustainable Finance Initiative, which counts among its aims "underpinning improved risk management and financial performance through explicit consideration of environmental, social and corporate governance (ESG) risks and opportunities in lending, insurance and investment"[25]. – The Responsible Investment Association Australasia, which publishes an annual responsible investment market benchmark report[26]. • Australian investors participate in some international sustainable/ethical investment initiatives such as the Climate Bonds Initiative, FAIRR, the Natural Capital Coalition (part of the newly formed Capitals Coalition).
FOOD COMPANIES AND RETAILERS REQUIRE CHAIN-OF-CUSTODY INFORMATION AND SUPPORT PRODUCT LABELLING	• Some food companies and retailers are beginning to experiment with the use of new technologies such as blockchain to track chain-of-custody information, enabled by tech companies e.g. AgriDigital[27]. • Major supermarkets have made specific procurement commitments through schemes such as Roundtable on Sustainable Palm Oil, Fairtrade, Rainforest Alliance. • Procurement requirements or incentives linked to industry-led sustainability certifications and standards such as those included in agricultural Best Management Practices have not been widely adopted by food companies or retailers. • Broad trend away from government intervention[28], e.g. food marketing regulation mostly on a voluntary basis operated by food and advertising industries[29]. • Food labelling guidelines do not reflect sustainability considerations as in, for example, Brazil, Sweden, Netherlands[30].
NON-GOVERNMENT ORGANISATIONS ENCOURAGE ACCOUNTABILITY	• A number of initiatives focus on providing policy makers or consumers with greater information about the social and environmental impacts of food products, such as the FoodSwitch initiative[31], Ethical Consumer Guide[32] and the Shop Ethical! app[33]. • Non-profit environmental and social organisations have run campaigns targeting specific companies or specific value chains[34], for example the Wilderness Society Australian Beef & Deforestation Corporate Scorecard[35].

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FOR MORE INFORMATION

The Land Use Futures program is working to adapt the global transitions to reflect Australia's unique national and regional circumstances, and identify key actions to accelerate the transition. This paper is the first step in that process.

Find out more about Land Use Futures by visiting our website: www.climateworksaustralia.org/project/land-use-futures

The Land Use Futures program is led by ClimateWorks Australia (working within the Monash Sustainable Development Institute), Deakin University and CSIRO.

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ClimateWorks Australia is an expert, independent adviser, committed to helping Australia and our region transition to net zero emissions. It was co-founded through a partnership between Monash University and The Myer Foundation and works within the Monash Sustainable Development Institute.