

# AJASN AGRI – Newsletter

February 2017

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If Australia is just to maintain its current share of exports by 2025 an additional \$A109 billion of capital is needed. Moderate growth in market share could cause this figure to increase substantially to \$A133 billion.' ([ANZ report](#))

## Public policy, public sector (& related)

The average tax on petrol in 157 nations fell 13 percent from 2003 to 2015; only a third of the nations analysed lowered taxes or raised subsidies, this was enough to tilt the global total in the direction of a [net drop in gas taxes](#). This [article](#) addresses peak oil and the role energy plays in the economy, including the food system.

This article suggests a [better food system](#) can be created by organising regional governments to create markets for smaller producers, and establish coordinated networks that can amplify best practices (à la renewable energy sector.) The [Pardue RAND Food-Energy-Water Index](#) measures the current state of food, water, and energy security and allows for analysis of these topics under future scenarios (might be useful for foreign aid calculations.)

This [paper](#) explores how mapping how rural landholders self-identify (e.g. farmer) might lead to a more targeted approach to landholder engagement in NRM (natural resources management.)

Farm (agricultural) [subsidies](#) might fall in the EU, after Britain leaves. The Australian Productivity Commission is looking into *Trends in Trade Policies: What do they mean for Australia?* A [research paper](#) is expected mid-July.

The Northern Territory and Commonwealth governments [differ](#) on where to focus agricultural development efforts – in the Ord or Katherine regions – this affects the Commonwealth's *Developing Northern Australia* plans.

[Towards Better Food Policies](#) provides an executive overview of OECD work on agriculture and fisheries, and contains comprehensive lists of references to all evidence developed over the past five years. This OECD study looks at the implications of [water scarcity](#) for economic growth. [Researchers](#) (U.S.) suggest that by the end of the 21st century, there will be a need to shift agricultural lands predominantly reliant on irrigation to focus on rainwater.

Environmental [regulation](#) on the meat industry in China will drive a surge in modernisation for the country's pork sector and curb production as farms pay a tax for the proper handling of effluent.

## Farming

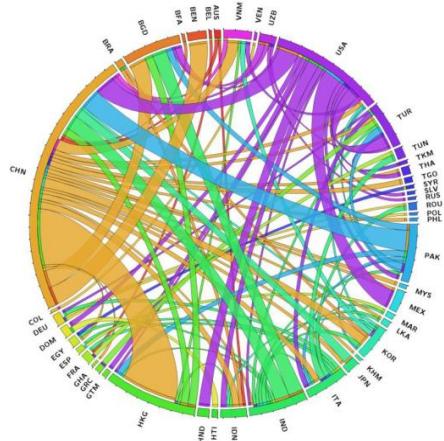
A new [study](#) is investigating the diet for farmed barramundi. Giving wheat a '[sugar rush](#)' increases growth and makes them more resilient to drought (in experiments.) Australia's wheat yields have stalled since 1990 ([research](#)); the wheat industry is Australia's most valuable crop.

[Research](#) found a big difference in the yields produced by alternative agricultural management practices in commercial fields compared with the same practices in the small experimental plots ordinarily used to test them. This [study](#) analyses several aspects of organic food and organic agriculture. Several abstracts for articles on predator-friendly farming practices (incl. dingoes) are [here](#).

This study looked at the global [loss of rural farmland](#) to urban expansion.

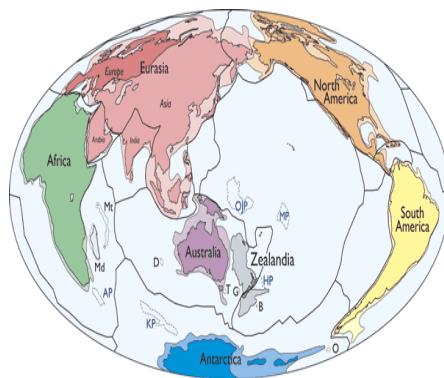
This [UK research](#) shows under current conditions, it is actually only cost-effective for farmers to use preventative treatments in areas where scab risk is highest - For farmers in other areas, it is more cost-effective in the long run for them to only pay to treat if and when their sheep flock gets scab. Scientists [edited genes](#) to show it is possible to create (bovine) tuberculosis resistant cows ([here](#) too).

## Ecosystems



**This study looked at the impact of preferential trade agreements - growth and resilience (diagram is cotton trade.)**

**... In the coming years, water scarcity is likely to become Asia's defining crisis ... (source)**



**Map of Earth's tectonic plates and continents, including Zealandia (a newly identified continent which is mostly submerged, not yet widely recognised)**

A collection of studies evaluated the effectiveness of numerous tropical forest conservation policies and programs in Africa, Asia, and Latin America ([article](#).) this [article](#) discusses primate extinction. This simulation suggests three major factors tend to [help sustainability](#) emerge, & [here](#).

This [opinion piece](#) looks at problems arising from the way conservationists and primary producers define biodiversity ('conservation biodiversity' vs. 'production biodiversity.') To compensate for government underfunding conservation biodiversity, Australia should consider [leasing wildlife](#) (incl. threatened species) to private groups.

This article maps areas where [novel ecological systems](#) are more likely to emerge, driven partly by climate change. Cities are driving rapid evolutionary changes to plant and animal species, according to a [study](#). In other words, by building cities we're also driving evolutionary changes that could affect the sustainability of those cities down the line.

This [paper](#) looks at two natural resource industries – fisheries and forestry – that are highly susceptible to ecosystem collapse and government intervention policies.

This [opinion piece](#) discusses an *Index of Sustainable Economic Growth* – the index would measure GDP per head, divided by percentage unemployment and divided by carbon dioxide emissions per head.

The February 2017 issue of [Decision Point](#) presents a series of stories on ecosystem services (the benefits that nature provides) and the decisions made around them. This paper highlights the importance of [habitat](#) diversity (not only species diversity) to ecosystems. This [paper](#) links globalisation to invasive species and expects continued growth in invasive species.

China is moving to preserve areas of ecological importance – this [article](#) outlines these and other plans. And, China is also developing and testing a new metric to measure the contribution of nature to human well-being, called Gross Ecosystem Product (GEP). International [researchers tested](#) 4000 kilometres of China's coastline, finding sediment from estuaries - where fresh water from rivers and streams meets the sea - had levels of antibiotic resistance gene pollution ranging from 1 million to 100 million genes per gram.

This [study](#) investigates the impact of deep sea mining on marine ecosystems.

## Climate

A [carbon countdown clock](#) from researchers at the Mercator Research Institute on Global Commons and Climate Change suggests we have 365 days left to do something drastic with our carbon emissions before we lock in a future of drastic climate change.

Rising ocean temperatures are leading to a rise in shellfish infected with a potentially deadly toxin (domoic acid), according to new [research](#). A paper on *The Interaction of Climate Change and Methane Hydrates* is available [here](#).

This [paper](#) looks at the efficiency of Earth's global atmosphere as a heat engine in response to climate change (a new / different take). It is increasing for the past four decades. This suggests a greater potential for destructive storms in some regions. Global warming has already increased the risk of major disruptions to Pacific rainfall, according to this [research](#). The European Environment Agency released a [report](#) (once every four years) that links climate change and extreme weather.

This [work](#) addresses skepticism about climate change (driven partially by personal experiences) and suggests how communications might be improved. This [research](#) shows connecting behaviours to goals that are important to people, even if such goals are unrelated to climate change or the environment in general, might deliver wanted behavioural / policy outcomes. Increasing price volatility and increasing frequency of extreme weather events may affect [smallholder farmer communities'](#) willingness to cooperate in community-level collective action problems (i.e. an association with lower investments in public goods when facing collective risks.)

This [article](#) discusses research on six tips for creating a good climate change graphic.

## Health

The US FDA has introduced [new rules](#) (a voluntary ban) for medically important (for humans) antibiotics – putting them under the control of veterinarians – this will make it harder for farmers to use them to promote animal growth. A [study](#) in Anchorage, Alaska found that gulls congregating in urban areas were far more likely than their rural counterparts to be carrying strains of antibiotic-resistant Escherichia coli or E. coli bacteria. This study suggests preventing the evolution of [antibiotic tolerance](#) may offer a new strategy for delaying the emergence of resistance.

Researchers have described attempts to create pigs with human organs inside them ([Cell](#)) to eventually grow human organs for transplant inside barnyard animals. The results so far are sketchy at best.

Local legislators in Torba Province (Vanuatu) plan to [ban junk food](#) (a ban on all foreign-imported foods) within two years.

Antibiotic resistance in agriculture affects people. A [study](#) found for the first time that the genes that give bacteria their resistance to last resort antibiotics are being spread by flies (in China, in the poultry sector.)

## Science & technology

Based on a global survey, a group of researchers has found that the most [effective fisheries management](#) relies on science-based catch and fishing limits. The maximum catch potential of fish would increase by three percent for every degree Celsius decrease in surface temperature, report the researchers in [Science](#).

This study discusses a [new way to test](#) for a wide range of micro-pollutants in waterways.

Statistical methods in [several papers](#) by 'The Food & Brand [Lab](#)' at Cornell University (which uses behavioural science) have been questioned.

Researchers describe pollinating drones in a [paper](#) but they are not yet ready to replace bees / other pollinators (i.e. a success but not commercially viable as yet).

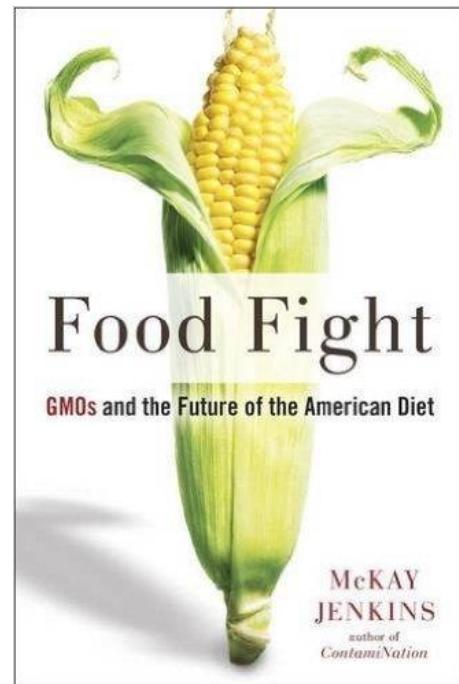
Scientists are working to create daughterless mice only able to have male offspring via gene drive – this is related to [synthetic conservation](#) (i.e. used to revive extinct animals, revive endangered species with shallow gene pools, or knock out invasive pests ravaging native plants and animals.)

This EU Parliamentary research [blog post](#) looks at the Ethical and social challenges of agricultural technologies. A [paper](#) looks at 'Metrics of Sustainable Agricultural Productivity.' This [study](#) describes a mathematical equation that can be used to determine the impact of the Anthropocene.

## Forward 'looks'

Science fiction writers [speculate](#) about the future of climate change. Here are [four scenarios](#) on precision agriculture (EU.) The key drivers shaping the future of the [industrial packaging](#) market over the next few years will be making packages lighter, safer, shapely and recyclable. A new book [Homo Deus: A Brief History of Tomorrow](#) looks at how technology industries and governments will influence what comes next ...

William J. Sutherland et al. A 2017 Horizon Scan of Emerging Issues for Global Conservation and Biological Diversity, Trends in Ecology & Evolution (2017).  
[DOI: 10.1016/j.tree.2016.11.005](#)



This [book](#) argues GMO technology has simply allowed an already industrial system to become even bigger and more efficient (i.e. we are having the wrong conversation).



A [study](#) investigated the genetics of green tree aphids and 'how to be a successful pest.'

## Assumptions

At cross purposes? This [article](#) says the public's wariness with ... new technologies is largely based on ethical, religious and social concerns, rather than concerns about safety or efficacy, which is what regulatory agencies ... consider.

## News

An [avian influenza virus](#) (H7N9) that emerged in 2013 is suddenly spreading widely in China, causing a sharp spike in human infections and deaths.

ANAO released an [audit](#) of the Department of Agriculture and Water Resources' implementation of its new biosecurity legislative framework.

The U.S. Department of Agriculture website removed inspection reports and other information about the treatment of animals at thousands of research laboratories, zoos, dog breeding operations and other facilities. This information will be accessible via Freedom of Information Act Requests ([statement](#)). (It reposted some information later.)

The European Commission launched a 3-month [public consultation](#) on the future of the Common Agricultural Policy (in February).

By 2025, the Canadian agricultural industry could be short [workers](#) for 114,000 jobs.

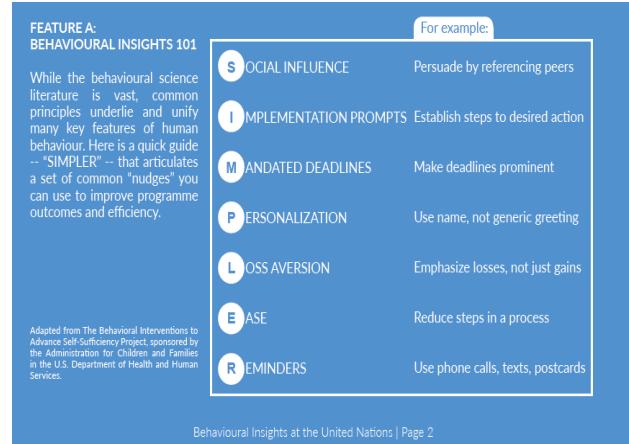
The two largest U.S. trade groups for the grocery industry have adopted standardised, [voluntary regulations](#) to clear up what product date labels mean – manufacturers will be encouraged to use only two: Use By (safety) and Best if Used By (quality.)

Stanford scientists have developed a new way for [estimating crop yields](#) from space (compact satellites.)

## Useful websites

The UAE has launched an [online platform](#) to support its efforts to spread a culture of foresight.

A new project called [Treepedia](#) uses an algorithm and Google Street View to map trees in cities, making it possible to see differences in greenery between streets and cities as a whole.



This graphic identifies nudges that can be used to achieve program outcomes (UN [report](#).) See similar EAST framework from the UK ([here](#).)

## Upcoming meetings

**Next meeting** 23 March 2017