



ALLFED

TASTING SECURITY

FOOD SYSTEM VISION PRIZE 2050

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2020: THE OVERTON WINDOW OPENS AT THE PRECIPICE

Preparedness Brought to the Fore

In his 2020 book *The Precipice*¹, Australian philosopher Prof. Toby Ord laid out a grand strategy for humanity to ensure that another global adversity doesn't threaten our existence. His strategy begins with reaching existential security, a place where the risk of global disasters is low enough that humanity can be secure in the knowledge that there **will be a future**. Ensuring that we have enough food to feed everyone, no matter what challenges we face, will play a central role in ensuring humanity reaches this safe haven, along our path to reaching our true potential.

An Era of Disasters

The journey to tasting security starts in 2020 Adelaide, South Australia (SA), where the efforts of the volunteer firefighters who have shown valour in the face of the largest scale bushfires in Australia's history have highlighted a need for preparedness across disciplines.^{2,3}

2020 has provided many challenges for SA, starting with an unprecedented bushfire season which scarred wine regions around Adelaide and destroyed prime agricultural land in Kangaroo Island. This was shortly followed by the fast escalating challenges posed by the COVID 19 crisis which locked down borders and crashed stock markets. Although SA's food system escaped majorly unaffected by the pandemic, experiencing only minor disruptions to internal supply chains and some panic buying compared to other countries, people were posed for the first time with the question:

'What would happen if we run out of food?'

For now this question will likely remain a question in SA, but SA and the world should not forget this feeling of vulnerability. We should witness the impacts COVID 19 has had on food systems around the world, such as the food migrations in India⁴ and export bans, which have plunged millions into food insecurity and realise that these disasters can cascade to create extremely damaging outcomes, such as the locust plagues in the horn of Africa⁵. Uncertainty still looms on how COVID 19 will interact with climate change induced disasters as it proceeds, and how this will affect food security.

With the fragility of our food systems revealed, we can no longer deny the risk we expose ourselves to by continuing the status quo. We must reimagine our food system, reassess how we value resilience against efficiency and have the resolve to implement these changes to create a food system that can respond to disasters of an uncertain future.

Dr Robert Glasser of the Australian Strategic Policy Institute, former Special Representative to the Secretary General for Disaster Risk Reduction noticed that the Overton Window for preparedness work has been cracked open, commenting that the timing of this vision "could not be better" with respect to the recent bushfires.

The Prime Minister of Australia established the National Royal Commission into Black Bushfires on the 20th February 2020, commenting that "we need to look at what actions should be taken to enhance our preparedness, resilience and recovery through the actions of all levels of government and the community, for the environment we are living in." ⁶



False Sense of Food Security

2020 Australia ranks at the top decile of nations for food security today with its high food production per capita. However, it falls in the bottom 50% of nations in food resilience given its vulnerability⁷. Persistent pockets of food insecurity still do exist in Indigenous communities and in remote Australia particularly⁸.

South Australian agriculture has its challenges, including unpredictable rainfall projected to fall by 5-15% by 2050, a long hot growing season and fragile soils⁹. Ingenuity and determination has allowed SA agriculture to reap the benefits of its significant land endowment; however, these practices need to be adapted and expanded on for SA to continue to reap the benefits. SA's food system faces 3 primary challenges: lack of resilience and adaptive capacity⁷, stagnating export growth¹⁰ and associated decline in rural areas, and public health¹¹; solving them could transform SA into a global leader.

Regarding resilience, SA is already experiencing the brunt of climate and environmental challenges which are increasingly expected to impact global food systems. In recent years alone, it has suffered the worst drought in living memory, a "Black Summer" of bushfires and the impacts of COVID-19⁶. SA's semi-arid climate puts it at increased risk for such events. Droughts and bushfire have torn through agricultural regions with many losing family farms. Specifically, the Adelaide Hills wine and fruit growing regions, as well as Kangaroo Island, a fine food and wine tourism hot spot, were hit especially hard. This poses not only a threat to food security, but also to livelihood security.

Even farms which survived the flames suffered smoke damage which made grapes virtually worthless. In fact, a stakeholder we spoke to, Mr Martin Haese, CEO of Business SA and Chair of the Premier's Climate Council, had the following to say about the importance of such a project at this time:

"Food and water over the next decade and beyond, in terms of the security of both, are probably more critical than anything else... I see an opportunity here for South Australia as this is an endeavour where our great state already performs well. South Australia is well regarded for its clean, green produce that is supported by innovative agricultural practices and appropriate regulatory controls. One day soon, I think that the world will be knocking down our door asking how we achieved this. I think that's a place of strength for South Australia to potentially be in."

This relates to the second point: Australia's share of agricultural exports - vital both for food security overseas, but also for livelihoods and rural prosperity in Australia, has been declining. Many rural communities are losing populations, as farming looks like an increasingly risky industry in a warming climate. SA's contribution to Australia's agricultural exports has decreased from 4.6% to 3.5% in 2019 alone. These rural communities are hit especially hard by supply disruptions such as bushfires or droughts, but also decreases in demand recently experienced as a result of COVID-19, including much fine produce such as wine or seafood usually sent to Asia. Global conversations about whether the global wealthy can continue to maintain Western levels of meat consumption, for which Australia tops the list, also threaten our livestock farmers. These difficulties have very recently escalated with China imposing significant tariffs on Australian produce. Farmers, producers and rural communities more broadly desperately need new industries and production choices to maintain livelihoods.



Australia can not only continue to export food, but increasingly it can export knowledge and technologies about how other world regions can adapt as they increasingly experience what Australia is already feeling the force of.

SA is also a land of opportunity at the present moment, with a farming sector and red meat industry already having a carbon neutral goal for 2030. The federal government plans to increase the farm gate value of agriculture to \$100 billion¹², from roughly \$60 billion currently. Therefore, transforming the resilience of agriculture in Australia presents a perfect opportunity to demonstrate empirically that an agricultural sector can simultaneously achieve resilience and carbon neutrality, while still achieving and even increasing economic prosperity.



2023 ADELAIDE: PROSPECTING FOR ROBUSTNESS

SOUTH AUSTRALIA DOES PROVIDE A UNIQUE OPPORTUNITY TO HOST A TEST BED FOR FOOD SYSTEMS RESILIENCE. WITH OUR UNIQUE COMBINATION OF CLIMATE AND GEOGRAPHY, IT PROVIDES A GOOD MODEL FOR FUTURE FOOD PRODUCTION IN OTHER PARTS OF THE WORLD.

CAROLINE MCMILLEN Chief Scientist for South Australia

Inspiring Promise

After the combined shocks to the system of COVID-19 and the bushfires, SA turned to **prospecting for robustness**. The impetus provided by the direction and urgency of this vision, and subsequent regional resilience assessment provided a tinderbox, this time one that lit the light in people's imagination through partnerships between food producers, suppliers, academia, innovators, think tanks, government and citizens. Academic institutions have established the building of knowledge and understanding around the emerging field of **alternative foods: those that are resilient, robust or rapidly responsive to disturbances**. Building this knowledge is a multi-disciplinary effort, taking academics to the edge of their comfort zone, and tipping the adventurous amongst them into inventive mindsets. Teachers have distilled these new concepts into a budding school of thought, with courses developed ready for new fresh students to consume.

Catalysing Ingenuity

Realising the value of a resilient food system, SA government lays out the challenge for resilience and response to food companies from around the world to showcase their technology's merit in SA's challenging environment. This influx yields an ecosystem of experimentation and Deep Tech incubation centred around these early movers and supported by the Resilience and Response Food Institute and associated incubator.

The result is a gold rush opposite to that of 1850, when nearly every able bodied man fled to Victoria and Ballarat¹³ to strike gold. By 2023 Adelaide will be buzzing with people from across Australia and the world, who have come to reap the rewards of developing resilience and response technologies such as precision fermentation, biochemical sugar conversion and chemical synthesis that decouple food production from traditional inputs: soil, sun and water. The incubator space pairs academia with industry aiming to operationalise ideas quickly, encouraging quick hypothesis testing ensuring ideas fail fast and rebuild. Laboratories, co-working spaces and presentation areas enable students, inventors, startups, spin-offs and more to collaborate.



SA's Full-Stack Resilience Research Cluster

The highly interdisciplinary **Resilience and Response Food Institute** is formed and begins work building on literature concerning resilient and responsive foods¹⁴. The Institute is a major draw to SA's academic institutions, attracting students from across the world looking to learn how to weave regenerative agriculture, alternative foods and disaster risk forecasting into a robust system capable of feeding a region under various stressors.

OUR HIGHLY NUTRITIVE PROTEIN FLOUR IS A PROMISING PILLAR FOR THE FUTURE SAFEGUARDING OF FOOD SECURITY FROM SMALL SCALE TO THE LARGEST SCALE.

DAVID TZE CEO, NovoNutrients

This holistic ecological assessment of all factors that can affect the food system enables mapping of advanced scenario planning that can simulate threats to the food system and offer insights into how further technologies can be developed to meet these challenges. Integrating the resource systems mapping, weather data, and the characteristics of the resilient foods and technologies onto a unified platform will create a powerful live predictive software. This software will highlight when the wider food system may become exposed to vulnerabilities and can suggest the exact system change, whatever the perturbation to the system.

Graduates take these skills and adapt them around the world, expanding the network of resilience and response-ready regions and growing the body of knowledge on resilience and response-ready foods captured by the Resilience Software Platform.

Research minded graduates stay to take advantage of SA's world renowned Food System Resilience Research Cluster with dreams of revolutionising the field with ground breaking discoveries.

Liz Specht, Associate Director of Science & Technology from the Good Food Institute commented on ALLFED's suggested shift towards more resilient foods, saying:

"Alternative proteins -- that is, protein-rich products derived from plant-based ingredients, microbial fermentation, or animal cell culture rather than from animal farming -- offer the potential for much greater flexibility in primary inputs as well as vastly improved efficiencies and accelerated manufacturing timelines. All of these aspects contribute to greater resiliency of the food system. Microbial fermentation and cultivated meat lend themselves particularly well to situations where primary agricultural biomass is in short supply. Because the primary inputs for both of these cell culture-based production processes -- predominantly amino acids and hydrocarbon sources -- can theoretically be derived from any source of biomass, this opens the door for diversion of biomass from unconventional sources to serve as a feedstock for cultivating high-quality proteins. Many species of microbes are also able to utilize non-biomass-based feedstocks such as methane, hydrogen, or carbon dioxide as primary energy sources, thus enabling food production even under extreme conditions."¹⁴



2026: FORGING THE PATH

Long-termist,¹⁵ welfarist, and tentatively impartial¹⁶, philosophy is a central tenet of the institutions formed; as such, policies and financial mechanisms are developed to reflect this. The resulting regulatory environment is dynamic yet stabilising, helping emerging safeguarding technologies scale into industry rapidly, and new food products enter the market quickly through streamlined certification processes. This is achieved through a governance structure that ensures equitable risk and value sharing between inventors today, industries tomorrow and future generations in or out of disaster situations.

Part of these regulations include patent conveyance, in the event of extreme disasters, which ensures critical technologies become available when they are needed most. Companies receive compensation for release of technologies but predetermined release conditions ensure rapid response. These regulations have been designed to be adaptable to various regional regulatory environments and scalable so as the resilient cities network expands, participating regions and aligned industries can experience similar conditions.

Physical disaster vaults in resilient safe houses around the world guarding key intellectual property that can be tripped to open when the disaster occurs and the conveyance parameters are met. Inside contains all key information for operating or scaling production facilities depending on the scale of the disaster, ensuring critical technologies become available when they are needed most.

Improved disaster risk assessment techniques and scenario modelling provide a new level of food system coordination. These assessments assign **Disaster Risk Resilience Metrics (DRRM)**, to production, processing and distribution components of the food system according to their ability to function under adverse conditions e.g. Response Seaweed Farming Co. is rated to scale to produce 1M tons of seaweed under extreme drought. Company production capacity and DRRM are then recorded in an open database allowing transparency concerning business continuity; incidents of significant disruption are also logged. These metrics have internalised the value of resilience in the cost of the production, increasing the realised value of resilience and response food production methods without making methods overly inefficient through rigid regulatory requirements.

CLIMATE CHANGE IS CLEARLY A FUNDAMENTAL THREAT, NOT ONLY TO AUSTRALIA'S AGRICULTURAL EXPORTS, BUT ULTIMATELY TO DOMESTIC FOOD SECURITY AS WELL. THE ALLFED INITIATIVE WILL HELP DEVELOP STRATEGIES TO BUILD THE RESILIENCE OF OUR FOOD SYSTEMS AND GENERATE LESSONS THAT WE CAN SHARE IN OUR REGION AND GLOBALLY IN THE CONTEXT OF OUR RAPIDLY CHANGING CLIMATE.

DR. ROBERT GLASSER Visiting Fellow, Australian Strategic Policy Institute



The **Resilience System Department** maintains this database and uses the information to manage food system profiles according to the various risk and resilience dimensions, such that the system can resist and respond to many severe disaster scenarios. Part of this process involves transitioning ill-suited food system processes to more suitable ones; the resilience department helps affected parties to adapt practices through various incentives and schemes, a common example being the transition of high disaster risk farmland to native vegetation projects. Such projects allowed climate change affected agricultural land owners to become producers of ecological services such as carbon sequestration and water table recharge. These were initially met with scepticism, but these now widely endorsed initiatives have allowed rural vitality to be maintained and have been absorbed into SA's new farming identity.

Adapted Agricultural Practices

Corn was not something you could just throw on the barbeque when humanity first began eating it. Aside from the difficulty in finding a barbecue 10,000 years ago in Mexico, corn was still just a grass called teosinte. This strain was genetically engineered through selective breeding to become our most produced crop worldwide today. This tradition of genetic modification was revived in 2020 for SA through lifting the ban on genetically modified organisms, which catalysed change during the formation of SA's full-stack food resilience research cluster¹⁷. Whilst controversial at first, soon these practices became widespread, leading to an explosion in variety and capabilities of crops. Some areas opted to maintain their GMO-free status such as Kangaroo Island realising benefits for GMO-free markets, while others found value in improved capabilities with regard to drought, salt and acidity tolerance, and fertilizer and pesticide requirements.

Underutilized native crops have become more mainstream and demonstrate enormous co-benefits for agricultural resilience. Evolved for the harsh Australian environment and therefore more tolerant to drought, their use has also increased the diversity of crops improving agricultural biodiversity. Some selectively bred native plants have started to show great promise with targeted modification research looking to improve other characteristics.

Hemp requires very little water, improves soil quality, and can tolerate saline environments. Hemp is extremely versatile and also produces hemp seeds and omega 3 oils which are very beneficial to health. Hemp is also a highly lucrative crop which could be planted in many parts of rural SA which are currently facing a dilemma of what to grow in a harsh environment. This can play a part in revitalising rural economies and bringing investment to SA.

Increased diversity of crops has improved diet with noticeable benefits to public health. The greater variety of flavours and tastes and increasing appreciation for indigenous knowledge and practices has provided an opportunity to engage the indigenous community of Australia in the food system. Regenerative agriculture has become a key component of the resilience toolkit. Capable of simultaneously decreasing vulnerability to drought by increasing rain water retention in soils, sequestering carbon, and increasing on-farm biodiversity, the early adopting farmers have reaped the ecological and financial benefits, truly a win-win.



Many more farmers have begun to follow suit and embrace regenerative agriculture in various regions. Although many of the resilience proposals are high tech, the inclusion of regenerative agriculture has been a very important change for rural communities, helping address food system resilience in a complementary way to alternative foods.

Discarded But No Longer Forgotten

As concepts of resilience and response of food systems have started to take root in SA, many often forgotten food system components have been put under the resilience lens. Packaging, the readily disposed of partner to food has been reassessed to see how its lifecycle can be altered to increase resilience. Utilizing agricultural residue streams to create packing in the form of bioplastics has been one strategy, providing other revenue sources for flexible industry and biorefineries. More innovative packing design approaches have examined materials such as alginates to create spheronised nutritional liquid balls, that are fermented to increase microbiomic qualities and preserve the food. Improved packing and logistic strategies along with psychological nudge tools are also being investigated by Fight Food Waste Community Research Collective to minimize food waste - another way to ensure food availability is maintained.



2035: THE YEAR WITHOUT RAIN

THE ALLFED SUBMISSION IS FULLY IN LINE WITH
AVECOM'S VISION TO DEVELOP SUSTAINABLE SOLUTIONS
FOR ENVIRONMENTAL AND INDUSTRIAL PROBLEMS.

PROFESSOR WILLY VERSTRAETE Director, Avecom

Multiple BreadBasket Failure (MBBF)

SA's now significantly adapted food system is put to its harshest test so far. 2035, a year characterised by extreme weather patterns in the southern hemisphere, plunges major wheat producing regions of Australia into an unprecedented drought. 'The year without rain' as it is now remembered in SA causes massively decreased yields and near complete failure in some regions. Overlapping extreme weather in other important food producing regions such as South Africa along with moderate global yields in previous years has put significant stress on the world's food system.

In SA, resilient crops, such as the multiple drought resistant cereals that have been developed since GMO bans lifted, are widely used. The developing hemp industry and increasing number of farms using regenerative practices have increased water retention through increased carbon content and have fared much better, ensuring some portion of cereal production has been maintained.

Throughout the year as drought worsens, passing predetermined escalation thresholds for various alternative foods are deployed or scaled. Seaweed production capacity is rapidly increased with 50% of the total capacity utilized, while agricultural residues from the crops that survived are captured post-harvest and converted to protein concentrate. Seaweed and protein concentrates are combined with stored cereals to create nutritionally balanced affordable food, reducing food insecurity, while the lower grades of seaweed and agricultural residue have helped feed vulnerable livestock. Microbial protein is commonplace and used throughout the world, maintaining a constant output of protein for human and animal consumption, without putting any pressure on scarce water resources.

The database of disaster technology and strategies enabled dissemination of suitable knowledge to other affected regions, with some of the more rapid response technologies being exported and deployed such as seaweed production.

This first major test of SA's resilience and response capacity has allowed it to ensure food security for citizens and maintain a level of output during extremely unfavourable circumstances. Although a noticeable price increase does occur on global markets, it is manageable and many southern hemisphere countries do not experience major food insecurity; things could have been much worse.

SA's ability to respond to the severe drought is published around the world with the merit of recently matured response foods demonstrated for the first time. Rapid expansion of the resilient region's network ensues.

ALLIANCE TO FEED THE EARTH IN DISASTERS



Global interest in the Resilience and Response Foods Institute, the Future Foods Incubator, as well as the state's unique regulatory environment lead to an explosion in knowledge and technology exports from the blooming resilient food industry. This response to drought can be explored further on [ALLFED's entry to the Food System Vision Prize 2050](#).



2047: TRAVERSING ADVERSITY

Threatened Appetites

On the island of Sumbawa, Indonesia, just 3580 km from Adelaide lies Mount Tambora. In 1815, this stratovolcano plumed enough ash into the atmosphere to cause a year without a summer. The effects were global, with crop failures across Asia and Europe causing over a hundred thousand people to die of hunger or disease. Emeritus professor at ANU, Anthony Reid said that the:

"science understands that it is the volcanic arch to the north of Australia that poses the greatest risk to humanity, and that another eruption of this scale would have unimaginable consequences for global communication, isolating Australia for months if not years."¹⁸

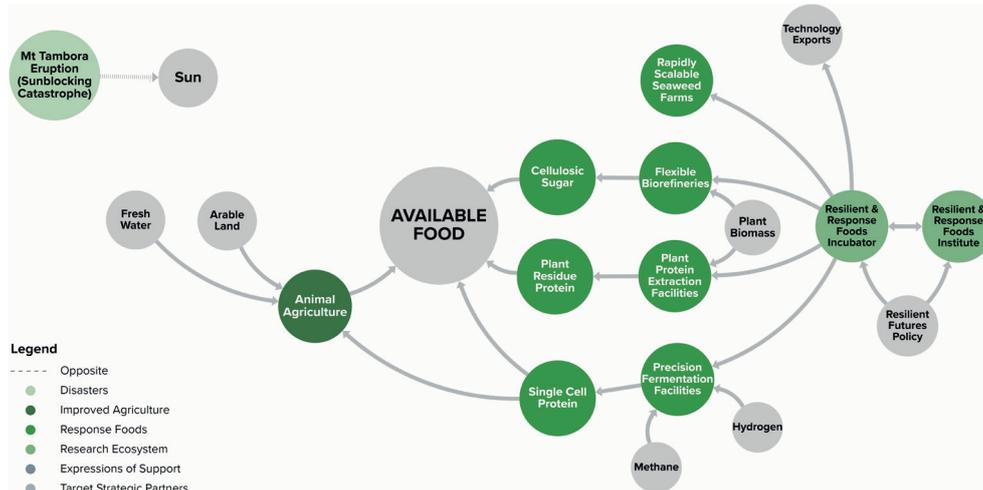
In 2047 these words became reality...

Failing to Prepare

With none of the preparation work described above, the world suffered the same fate as 1816. 24 hours after the eruption the ash cloud would expand to cover an area the size of Australia. Over the course of four months the volcano would continue to spew ash high enough into the atmosphere to block out the sun. The effects would be devastating, with cascading fourth-order effects throughout the economy, society and culture. The Earth's global temperature would drop by three degrees celsius, killing crops in the low temperature. Across China, the cold would kill rice crops, meaning the nation may stop exporting food. The monsoon would be disrupted, causing flooding in China and India, where the torrential rain could spread disease on millions. Up to 50% of Europe's harvests would fail, causing the worst famine since the 19th century on the countries around the world with the worst food security resilience. If Australia were unprepared as it is now, this would lead to increased food prices pushing those on the edge of food insecurity into food poverty. Billions starve.

Prepared Adelaide: The Year Without Sunburn

The magnitude of eruption and impact the volcano will have on food production is well modelled using historical data and Resilience and Response Production Metrics from the open database. Food Security response planners at the Resilient and Adaptable Foods Centre will have used this information to create calculated response plans for Australia, while allied institutes in other regions around the world would have done the same. Nearly every citizen knows the role they will play in making sure the world can be fed without the sun. The effects of the Mt Tambora Eruption on SA's food system can be seen in the map on the next page. This map also highlights alternative inputs to the resilient food technologies, that are unaffected by disasters.



The above map shows how an eruption of Mt Tambora would affect SA's food system and how response foods are able to ensure food remains available.

2047 Response Roles

By the time Tambora II occurs in 2047, the culture around food security in SA has been transformed, with each citizen having defined their role to play in the event of a major food shortfall, in a similar way that volunteer fighters choose their way to serve. Some start 3D printing and assembling open source designs of Leaf Protein Concentrate processing equipment, while others begin picking and preserving fruit and vegetables in the cities' public gardens. Volunteers feel empowered that they can contribute, while the many citizens are ready to make changes at work having prepared ahead of time.

Port Augusta's major hub of flexible non-food industries switch to food production producing sugar instead of ethanol and various other biocompounds. These industries are now commonplace based on a flexible ideology that has emerged, allowing a range of products to be switched on and off as supply demands, capturing the value of under-served markets. The increasing integration of industry at co-optimal scales enables symbiotic relationships between energy and food production, creating a resilient nexus of power, heating and food at the neighborhood level through the valorisation of waste streams. The extent of integration is so significant that utilities such as water can be co-opted during times of emergency to deliver food directly to homes in case supply lines are disrupted. Council members can authorize this switch but the impact of Tambora hasn't reached that point yet.



2050: TASTING SECURITY

Local is Global

In 2050 SA has been transformed, its journey creating the resilient systems that helped to save humanity from the global tipping point that Tambora would have created. It has taken not only Australia, but the rest of the world, to make a secure and resilient foothold for food. Adelaide's resilient food ecosystem platform, mapping all of its resources from water through fertilizer to rainfall and resilient, adaptable and responsive foods, has been exported around the world creating a network of highly resilient cities. This network of cities supported its neighbours around the world through the times of adversity seen above and stripped away traditional political boundaries and rivalries, as citizens around the world were highly connected to others from their experiences from COVID 19.

The graduates of Adelaide's knowledge and technology ecosystem have spread throughout the world, joining other alumni in the resilient cities network, or founding new resilient cities by exporting their skills and capabilities. This network shares best practice, enabling innovation to transition around the globe in a matter of seconds.

By 2050, relative land and water usage has reduced dramatically due to increased productivity, enabling food prices to come down due to increased use of farm-free production technologies. An entire new suite of tastes and textured foods are available due to the development of GMO crops in the early 20s. The food system we arrive at looks something similar to Figure 1, although with many more resilient and response foods that have spawned out of the incubation programme.

Distant policy horizons of 20 + year time frames are now commonplace and have changed investment patterns and policy choices. This increased stability has resulted in a switch to future directed investments with long-term returns, most people's superannuation portfolios now include significant renewable energy and resilient food infrastructure and service components. This increased capital availability has been a driving force in the implementation of the maturing alternative food technologies; agriculture has also benefited from this boom.

The re-distributed food production technologies that spawned from the incubation ecosystem in the early 20s has meant that neighbourhood scale production is the norm. As a highly resilient method of producing food, but also much less costly from a time perspective, all citizens can feed themselves from the produce at their local food co-operative, which they have a stake in. Grocery stores as we know them are a thing of the past, as what started as the microbrewery movement has now taken hold of the food industry too. The entire array of produce that can be created in store, using ingredients that are either piped to, or synthesised onsite and printed with food extrusion lithography. SA's consumers' food can become nutritionally precise to their requirements, as their encrypted DNA profile is easily shared to find a balanced meal they desire.



The outlook of most citizens has shifted considerably, as new working patterns and lifestyles have been enabled. Intelligent technologies have enabled lots of traditional roles to be automated, leaving new ways of people creating meaning in their lives. The traditional farming roles developed 10,000 years ago in Papua New Guinea continue for those who choose to do so as a leisure activity, acting as environmental land stewards sequestering carbon, whilst those using newer technologies sequester it from industrial emissions, closing the loop and making SA carbon neutral.

The continuation of farming is just as necessary for resilience as the uptake of these new technologies, as otherwise we would be exposed to mass system failures, such as cyber-attacks on precision fermentation facilities.

1. The precipice: existential risk and the future of humanity | Toby Ord 2020
2. [Australia's Volunteer Firefighters Are Heroes. But Are They Enough?](#) | The New York Times | Damien Cave, Matthew Abbott 2020.
3. "Unprecedented" globally: more than 20% of Australia's forests burnt in bushfires | The Guardian | Lisa Cox 2020.
4. ["They treat us like stray dogs": Migrant workers flee India's cities](#) | Nilanjana Bhowmick 2020.
5. Earth Day 2020 call for action: Mitigating the global food crises associated with COVID-19. | Terp et al. 2020
6. [National Royal Commission into Black Summer Bushfires Established](#) | Prime Minister of Australia 2020
7. [Global Food Security Index \(GFSI\)](#) | The Economist Intelligence Unit 2020
8. [Pathways to sustainable land-use and food systems](#) | 2019 Report of the FABLE Consortium
9. South Australia State of the Environment Report 2018 | South Australia Environment Protection Authority
10. [Primary Industries Scorecard 2018 - 2019](#) | PIRSA
11. [Australian Institute of Health and Welfare | Rural & Remote Health](#)
12. [Agriculture – A \\$100b sector by 2030?](#) | ACIL Allen Consulting 2019
13. [1850s Gold Rush](#) | South Australia State Library 2009
14. Feeding everyone no matter what" and other publications available at [ALLFED.com](#)
15. Long-termism here referring down the generations and onto the rest of humanity
16. Impartial welfare being about promoting wellbeing with everyone's wellbeing counting equally
17. [GM moratorium now lifted on mainland SA](#) | Tim Whetstone MP 2020
18. [Lessons of Tambora ignored, 200 years on](#) | Anthony Reid 2015
19. An interactive version of this map is available [here](#)

ALLIANCE TO FEED THE EARTH IN DISASTERS



Andrew from Adelaide

It is 6.30 am and Andrew has just awoken. He hits the shower and taps the option for breakfast to be prepared. He opts for a blueberry flavoured health shake. Whilst he dresses, this is being dispensed from the spout installed on the kitchen countertop. He grabs it to go and starts his commute.

This equipment, now standard in all households across South Australia, is plumbed into a network of pipes around Adelaide that carry nutritionally complete liquid food that can be flavoured at the destination. The network was installed in case of disruptions to the supply chain, but most citizens take at least one of their meals a day purely for convenience.

When Andrew does want to spend time on food is when he can take time to savour it with loved ones, with barbecues on the beach, his favorite weekend activity.

Andrew works as a Food System Monitor at Adelaide's world renowned Resilient and Adaptable Foods Centre, which he loves. The first thing he notices as he walks into the office is that something seems off. He can't quite tell why at first. Then he sees it - there's been seismic activity off the coast of Indonesia. He convenes a holo-conference with the monitors for each sub-continent. Andrew exclaims "this constitutes a Schedule 1 response", to agreement from all. After one clarification, work begins. Heads of flexible industry are contacted and their previous product switched to food production that does not require the sun, a public announcement switches government and citizens into response mode, and models consulted to look at how the flow of import/exports will be affected.

At 5pm, Andrew leaves the office, he hears on the news that the volcano Tambora has erupted spewing ash into the atmosphere as he expected. He heads for dinner safe in the knowledge that, unlike the last time Tambora erupted in 1815, the citizens of the world will eat and are well prepared for the year ahead

Sarah from Glenelg

Sarah is religious about the way she approaches food, health and exercise along with her two best friends and fellow foodies, Tess and Ryan. They plan their week around shared meals at their favourite lunch or dinner spots.

Sundays are reserved for microbiome beach brunch at Glenelg Wharf. The eggs, bacon, sausages and hash browns that traditionally have made for a greasy fry up are produced using nutritionally adaptive systems that ensure Sarah, Tess and Ryan have all the nutrients they need for a balanced meal. Ryan particularly likes experimentation, and never has the same brunch twice.

Even though the meal comes out looking the same, the taste profile of the dish can be altered to suit his fancy. Even so he always chooses random sausages, last week they were strawberry. Tess likes to go traditional, and enjoys her balanced Sunday brunch.

Fridays is sizzling steak night, but these steaks haven't seen an abattoir. Created from a fusion of cellular agriculture and food lithography that enables the printing of your steak straight onto the hot plate, these taste exactly like the real thing, because... they are.



Every South Australian has a role to play in moving to a 2050 where no one goes hungry and SA is the food resilience capital of the world.

We need researchers to move our understanding of resilience and response foods forward, we need inventors and innovators to catapult the new food technologies into reality, we need collaborations across disciplines, we need policymakers to create a welcoming regulatory environment for industry, we need entrepreneurs to realise opportunities and establish new businesses, and we need a forward looking agricultural industry that can adopt more regenerative practices.

Most of all we need you to reflect on what might happen if this time, when disaster hits, there is not enough to feed not just the world's poorest, but you and those you love.