

Ag2030

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Improving water use Maximising productivity of water sources

01

02

Food Production Livestock, Food & Veg, Seafood/ other

03

Food Waste Agriculture field + Domestic

Introduction



Delivering Ag2030

The Australian Government is setting the foundations for Australia's world-class farmers, fishers and foresters to rebound from COVID-19 and build toward the agricultural sectors' vision for a \$100 billion industry by 2030.

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To meet Ag2030's goal of increasing Australia's agricultural industry to \$100 billion, improvements must be made. In this presentation, three main areas will be discussed.

Following Theme 5: Water and Infrastructure, the first section will discuss improving water usage through seawater desalination plants.

The second section will discuss ways food production can be increased, through technological advances and increasing biosecurity.

Finally, section 3 will explore food waste, which will touch on Theme 4: Supply Chains and the role of the greater Australian community in combating food waste.

01 Improving Water Use



Droughts

Droughts and water scarcity remains a persistent problem given Australia's natural landscape, and is evermore evident with the increased effects of climate change. Rainfall has become increasingly scarce, demonstrating a need for other ways of procuring fresh water.



A drought-stricken farm in New South Wales



To maintain additional water supplies throughout seasonal changes, the government can invest in more seawater desalination plants, thereby making usage of Australia's geographical advantage as an island continent and accumulating sufficient freshwater for irrigation and animal husbandry during emergency droughts.

Seawater Desalination



A desalination plant in Victoria

In order to meet Ag2030's ambitious goal, combined with the increasingly devastating effects of climate change, more fresh water will be needed to support Australian crops and livestock. Building more seawater desalination plants can drastically increase access to fresh water.

Desalination is a technology that aims to remove the majority of dissolved salts from seawater to transform it into fresh, drinkable water using a reverse osmosis process. According to Melbourne Water, the desalinated water order since 17% has already bolstered Australia's water reservoirs by 15%, leading to positive externalities like pest control and increase of crop productivity.

Increasing the number of desalination plants not only boosts access to water for Australian farms and communities, it also creates jobs. For instance the Victorian Government estimates around <u>1700 workers</u> are needed per plant.

Seawater Desalination cont.

However, excess energy consumption is often associated with installation of seawater desalination plants.

A possible proposal to counter this issue could be to construct complementary hydropower turbines to offer renewable tidal energy as a clean source of fuel. These turbines can also offer as a way to redirect ocean currents, in turn preventing coastal erosion in surrounding areas of the seawater desalination plants.

For more information:

https://www.melbournewater.com.au/water-data-an d-education/water-facts-and-history/why-melbourne s-water-tastes-great/water-0



A video about the Victorian Desalination Project

02

Food Production

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UNDERSTANDING THE PROBLEM

Depletion of Food/Water Resources •

Whether it be animal husbandry, crop production or marine farming, the industrialised intensive farming widely employed in the current agricultural sector poses an issue against the scarcity of resources worldwide. Malnutrition and water scarcity is a problem suffered by ½ of the world population, yet just to produce 1kg of meat requires 20,000L of water as well as kilograms of animal feed, which could have translated to carbohydrate nutrition that could be directly sold, creating immediate profit and satiation.

Domination of Land Use

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The current form of mainstream farming heavily relies on large scale pasturing of animals, most notably cows for both their meat and dairy production. To meet this demand for land, deforestation is currently on the spike, especially following the recent Amazon bushfires, where large volumes of rainforests were cleared for agriculture. This not only exacerbates pollution, but also threatens organisms that were part of these ecosystems, damaged by human intervention.



Thus, on top of reaching the \$100 billion target, it is also optimal that these evident environmental/social problems are accounted/catered for.

Food Production (Fruit and Veg)

02: Enrichment Planting

 This involves involving and prioritising Indigenous mechanisms of agricultural development as these processes have continually sustained the health of Aboriginal lands and sustained large populations. This is achieved through the use of specific regions of bush that ensure lowered harm to surrounding biodiversity. This model is based on Traditional Aborginal practices and has been trialed in the Kimberley with Kakadu plums.

Food Production: GMOs

Genetically Modified Organisms (GMOs) could greatly benefit the agricultural industry. GMOs are already used around the world, with an estimated <u>80% of products</u> in supermarkets contain GMO ingredients. Furthermore, around 90% of US grown corn is genetically modified to increase their resistance to insects, and canola to reduce trans-fat.

Other applications of GMOs can increase other crops' resistance to pestilence and drought, reduce the amount of space and resources needed to grow them and make them more visually appealing to consumers. <u>Certain types of fish</u> have also undergone genetic modification to make them more cold resistant, grow faster and grow larger.

However, further research into GMO technology is crucial to ensure it is implemented safely, both for human consumers and for the environment. One risk would be if GM fish escape into the wild. Although they are unlikely to cause chaos akin to Jurassic Park level shenanigans (life finds a way!), they could potentially decimate native populations and destroy ecosystems.



Genetically modifying fish can dramatically increase their size.

Food Production (Seafood)

- Removal of most ocean and land aquaculture, such as tuna, shrimp, and other large fish farms
- Farm more carnivorous or vegetarian fish
- Increase amount of seaweed that is farmed for food.
- Encourage people to use recreational fishing methods to obtain fish, as this will take the stress of the commercial fishing industry, so less unsustainable farming methods will be required.
- Introduce stricter laws and regulations around the taking of fish for recreational and commercial fishers.
- If larger fish, such as tuna should be farmed, then that should be done on open ocean, in an enclosure of at least 2 square kilometres. A sustainable method of obtaining food for the fish should also be in place



Food Production (Seafood)

- Protect all species of offshore and reef sharks (shark fin soup is now illegal)
- Increase knowledge of consumption of species such as sea urchins, starfish and other potentially invasive invertebrates, that are not poisonous, potentially a farming opportunity here too?
- Also potential for GMO's in this industry also
- This industry may benefit from there being more people catching and eating fish recreationally, this would make it more sustainable as well.



Explanation

To explain these changes, my mindset needs to be explained first. I believe that the seafood industry is too commercial, and that the big companies that run this industry are not all that sustainable. The aim of these changes would be to decrease the unsustainable activities of these large companies, and increase the number of people taking fish for food. I am fully aware of the overfishing that could occur, especially in inshore waters, but that will hopefully be curbed by the stricter regulations that would be put in place. A ban of the taking of sharks altogether aims to help the ecosystems that need sharks, basically all of it recover and thrive. Many of the ocean farming methods that currently exist are seemingly cruel and unnecessary, caging in creatures that should be out on the high seas, such as tuna, these will be increased in size to make quality of life for the animals better, this may make it more expensive, but honestly, the more wild a creature is, if treated correctly, the better it will taste, and just be in general when it is needed. I am fully aware that some people may not like these changes, and that large amount of poaching, and this would have to be dealt with by the authorities.

Food Production (Other)

- Aquaponics could be used to increase amount of food produced, method is effective at both growing crops at a small scale, as well as farming freshwater creatures also, at a small scale, not widely used, as it does restrict the animals to a small space, which is not great for any animals.



03

Food Waste

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Food waste



Wall-E and spaceships are cool, but I think Earth remaining liveable is even more cool.

According to the Department of Agriculture and the Environment, food waste in Australia accounts for around 3% of our greenhouse gas emissions and costs the economy approximately \$36.6 billion annually. If this waste was completely removed, then that sum would more than cover the \$27.8 billion goal.

Furthermore, reducing food waste would lessen Australia's impact on the environment, improving our standing in the international community as a country that cares about the future of the planet, and addressing the catastrophic impacts climate change has on farming and agriculture.

Two areas in which food waste can be decreased that will be discussed in this presentation are on farms (or other places where food is produced) and at home.

Food waste (Farms)

Often farms experience major food losses due to a variety of reasons such as climate issues, rodents and fungus.

Additionally, food has also been destroyed during the transportation chain due to poor infrastructure and transportation, lack of refrigeration during travels, which ultimately leads to great amount of waste between the output of the producer and the time taken to reach the producer. In order to reduce these losses it is required that we improved communication in supply chains increase consumer power, improved purchase and consumption planning, and raise awareness on this issued through education about the major losses in the food transport cycle.



Food waste (At home)



While food waste occurs in all stages of the food supply chain, private households have been identified as key actors in food waste generation. However, the evidence on why food waste occurs remains scattered. There is growing awareness of the positive impact of reducing the amount of wasted food on greenhouse gas emissions, energy use, food and water security, and land use.

In developed nations, food waste generated in homes is a large contributor to the total amount of food waste. The behaviours and practices associated with this waste prevention (and waste generation) are complex for a number of reasons: food waste is the result of multiple, interacting activities and this leads to separation between the activity and their consequences.

Food waste: 'ugly' fruit and veg

2.4 million tons of produce never even reach consumers. According to <u>one Victorian farmer</u>, anywhere from a fifth to a third of her crop is not seen as suitable for major chains, due to cosmetic issues.

Major supermarket chains and the greater Australian community's attitudes towards 'ugly' fruits and vegetables must be changed to combat this excess waste of totally edible food. This can be done through ad campaigns and encouraging supermarkets to sell less cosmetically attractive produce such as Woolworth's 'the Odd Bunch' with lower prices which in turn incentivises consumers.

A more extreme method to prevent the creation of 'ugly' produce can be done through Genetically Modified Organisms (GMO) to make crops genetically more attractive to shoppers.



