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### **Part 1 - Climate Change:**

One of the main causes for climate change over the past years has been due to an increase in carbon dioxide emissions. Climate change brings more frequent and disastrous weather patterns or natural disasters. It is these disasters that are directly limiting the ability for farmers to grow crops. For example during a drought there is considerably less precipitation therefore, leading to a decrease in crop yield. Nearly all food waste in Australia is going into landfill where it is left to rot and produce greenhouse gases such as methane and carbon dioxide. Both of these gases are some of the main contributors towards the climate crisis. In 2019 Australian landfill produced 526 million tonnes of carbon dioxide which was released into the atmosphere. Through decreasing landfill, carbon dioxide emissions will also be decreased. This can also be done through renewable energy which can replace fossil fuel consumption and the money/ energy produced can be used to help farmers during tough times or be put into research into regenerative farming or other farming methods.

### **Part 2 - Incentivising Natural Capital:**

Natural capital is the world's stock of natural resources that directly and indirectly produce value to humans. Elements of natural capital include: land, ecosystems, minerals, geology, soils, air, water including oceans, all living organisms, as well as natural processes. By incentivising and rewarding farmer's who invest in increasing the natural capital of their land we can better protect the resources that are essential for sustainable and long term agriculture.

### **Part 3 - Increasing crop yield with FOGO:**

It is no secret that industrial agriculture disrupts soil nutrient cycles. Poor soil conditions, if not addressed, will reduce the quantity and quality of Australian crops. We need to restore our Australian soil to boost our crop yield and to do this, we propose that Ag2030 set their sights closer to home by supporting The Food Organics Garden organics system.

This is a kerbside collection system where food waste is collected from Australian homes and redirected to hot composting facilities, where it's turned into high quality compost in as little as 12 weeks.

By tapping into this massive source of organic material, we will not only be creating enormous amounts of soil-replenishing material, but we will be saving that material from going to our landfills.

Compost is key to improving crop yield for the Ag2030 target, so In short, we propose federal support for the FOGO program to fast track the program's implementation and tap into this incredible source.

### **Part 4 - Alternative farming and meat**

Plant based meat is an alternative to animal meat, which aims to replicate the taste, texture, and also the nutritional value of those products. The benefits of plant based meat to the environment is significant. Plant based meat saves 47-99% of land compared to animal meat. It emits 30-90% less greenhouse gases which makes a significant impact on the ever-growing climate crisis. It also requires 72-99% less water than animals to grow which is a limited resource, particularly in Australia.

Lab Grown meat is distinct from plant-based meat, mostly as it still involves the consumption of conventional meat, rather than a human-manufactured alternative. Some Benefits to this process would be [] However, like all new processes, the enactment of this process has its drawbacks

The meat industry is not the only one which has potential for innovation. Hemp farming is an option for alternative farming in Australia. There are pros and cons to it. The cons are that it can be very difficult to grow in Australia. Farmers have said that sometimes the seed will just not germinate. Furthermore right now there isn't anything in the industry in Australia that harvests the crop. Therefore farmers typically have to do this by hand or hire in harvesters. However, the pros greatly outweigh the cons. Firstly, the income of hemp per hectare is 10x the amount of wheat per hectare. Hemp brings in approximately 2812.5 dollars per hectare whereas wheat only brings in approximately 233.33 dollars per hectare. If we multiply the wheat economy by a factor of 10 it results in the hemp industry being worth potentially 41 billion dollars. Secondly, the growing season for hemp is short. It is approximately 120 days and there is very little industry competition. Finally, hemp improves the soil. When hemp grows, the male plant fertilises the female plant and then dies, providing nutrients for the female plant to grow. Hemp is a very viable way to bring in more money into the agricultural industry if invested in.

### **Part 5 - Water efficiency and food waste**

Drip Irrigation is the most efficient water delivery system to plants. Hose lines run along the root zone of the plants with holes which drip out a specified amount of water. Gravity sends the water to the roots of the plant where water is absorbed via osmosis so the plant can grow. This is all a passive process which removes a lot of the energy required in other water transport systems such as sprinklers. This also minimises loss of water due to evaporation meaning there is less water wastage.

The Tifa or Drop Program is an Israeli program which aims to introduce drip irrigation to rural areas in the middle east. This provides food security to areas that have never had that before. This is because relying on rain patterns to water crops is unreliable and very fickle. Food security is so important as it increases public health. When a society has public health and food security they can focus on increasing their economy. Australia could implement a similar program that encourages the implementation of drip irrigation on to farms in rural Australia, allowing them to become more self-sustaining.

The Tal Ya water technologies group created an innovative agricultural device. This reusable plastic tray collects dew from the air and then funnels the water down to the roots. The trays surround each plant and reduce the need for excess water by up to 50%. This is important in reducing the amount of water each individual farm requires in areas of water insecurity. Another added benefit is that they reduce the need for pesticides as it blocks the sun which means weeds cannot take root.

The Murray Darling Basin is a large area of South- Eastern Australia which contains a series of interconnected rivers and lakes. This Basin provides 3.6 million people with drinking and farming water throughout many local communities. Whilst there is a cap on the amount of water that can be taken from the basin in any given region, majority of farmers use the lake to water their farms. Additionally there is a major tourism and education industry of approximately 8 billion dollars. Education is an important element of the Ag2030 goal because a large amount of income is lost due to poor education.

7.6 million tonnes of food go to waste in Australia each year. This is equivalent to \$36.6 billion per year. We propose giving each household a certain amount of rubbish allowance and any excess they are charged a small amount for, similar to how an aeroplane will charge you for extra luggage. This will hopefully discourage food waste and encourage mindfulness of the amount of food each household throws out.

Whilst most of the 7.6 million tonnes is edible, some are infected by pests. One of these is the fruit fly which can lay up to 100 eggs each day. This can lead to entire crop loss for farms. Therefore pests like these need to be carefully monitored to ensure that there is less crop destruction and minimise the amount of food that must be thrown out.

### **Part 6- Conclusion**

Right now the expected worth of the agriculture industry is 71.2 billion dollars. By

implementing our strategies the Ag2030 goal can not only be met but exceeded. Let's say we spend the next 3 years significantly implementing our strategies and then 5 years gaining money throughout the industry. We can't reduce all food waste but we can reduce a significant portion and therefore we estimate that Australia could be saving and therefore gaining \$30 billion per year. The hemp industry is worth \$41 billion per year if invested properly and through our other strategies we estimate that collectively adds to \$1 billion per year. In conclusion by 2030 the industry would have brought in \$431.2 billion dollars. Additionally, in the year 2030 the industry would have \$143.2 billion which greatly exceeds the Ag2030 goal.

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