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How do traditional farming practices compare to innovative farming practices in creating better food safety in China?

China, a nation famous for its food and agricultural traditions, has the seemingly impossible task of feeding 1.4 billion people with only 12.7% of the world's arable land (World Bank Open Data, 2023). This has inevitably led to issues regarding food safety, food security, ethical consumption, and maintaining tradition. China's historic troubles with food production have become somewhat of a taboo; notoriously, Chairman Mao's 'Great Leap Forward' – which consisted of farmers giving up their land to join rural communes (Gries, 2023) – resulted in 'The Great Famine' which has an estimated death toll of 45 million and is considered to be the greatest man-made disaster in history (Branigan, 2013); a horrific event that began only a decade into the CCP's rule. While China's current issues with food production are not nearly at the same scale as this example, the nation is still dealing with a number of issues. The 2018 Food Sustainability Index placed China close to the bottom at 57th place in the agricultural sustainability category (ChinaPower Project, 2017). This follows a sequence of food safety scandals that range from contaminated baby milk to the smuggling of unregistered meat. This becomes a more pressing issue for the CCP as the growing middle class of Chinese consumers become increasingly aware and critical of the food they consume, with a 2016 survey finding that 40% of Chinese consumers consider food safety to be a 'very big problem' (ChinaPower Project, 2017). This essay will evaluate how successful traditional food practices can be, before exploring how the introduction of smart technologies into agricultural practices may be a more sustainable solution. This essay will also touch on how China's implementation of deglobalizing policies will affect the arguments made.

A documentary that offers relevant insight into this research question is *Dai's Garden* (2017). The documentary depicts a Chinese businessman called Dai Jianjun, who pioneers the Chinese slow-food movement. He has dedicated his business and lifestyle into bringing back Chinese food traditions amongst the backdrop of a rapidly urbanising and industrialising food industry. He runs a high-end restaurant in Hangzhou, in which the ingredients are sourced from small-scale, local farmers. The documentary also details how Dai invests the profits from his restaurant into an isolated village in the Suichang country, helping to improve the lives of those who live there.

This documentary is relevant to the research question since it introduces the idea of bringing back traditional farming practices as a response to declining food safety. It also provides a suitable amount of background knowledge for the spectator to understand the scale of the issue surrounding food safety in China. Furthermore, it provides a foundation for a critical approach to traditional farming practices – while the documentary leans towards a pro-tradition stance, there is room to disagree with Dai's approach.

I thought this documentary portrayed a poignant struggle that comes with tradition and progress. Dai believes that the passion and energy that is put into traditionally farmed food is reflected in the taste of the product – especially when compared to the 'soulless' products of other farms. The documentary positions the spectator to side with Dai's perspective. We are told that Dai's business is financially successful, with net profits reaching up

Figure 1 - A signature dish of Dai's Restaurant (Dai's Garden, 2017)

to $400,000 per year (Dai's Garden, 2017), and we are shown the preparation and result of some of his restaurant's signature dishes (Figure 1). The scene that shows the preparation of the dish in Figure 1, is particularly effective at showing this; the soundtrack is relaxing and uses fittingly traditional instruments, this alongside the muted sounds of the kitchen glorifies the production of Dai's food and guides the spectator into sharing his ideology of food. However, I can't help but acknowledge how Dai's approach is impractical for reasons that this essay will explain in a later section.

Agriculture has been a pillar of Chinese tradition for millennia; however, while the majority of domestic food is produced by the 200 million farmers that inhabit the rural landscape (Wfp.org, 2023), most farmers are straying from traditional techniques in favour of supposedly more efficient modern techniques, often including chemicals and pesticides. The main factors that differentiate traditional farming techniques are the use of indigenous knowledge, traditional tools, natural resources, and organic fertilizers (Shakeel, 2018). In *Dai's Garden*, Dai argues that these techniques are the solution to China's food safety crisis. This is supported by the idea that traditional farms don't use chemical fertilizers and pesticides which might contaminate the produce. Instead, they use natural fertilizers such as animal manure to fertilize the crops, thus providing produce that has been grown naturally. Furthermore, traditional techniques provide various long-term benefits, that result in more stable food safety across longer periods of time. In 2018, 15.5% of China's groundwater was labelled 'Grade V' (Figure 2), meaning that its unsuitable for any use (ChinaPower Project, 2017). While the issue is too complex to fully justify here, part of the blame can be put on the use of chemicals in agriculture, chemicals that are washed away into rivers or soaked into the ground, making there way into the groundwater. Since natural fertilizers are organic, water contamination is not as big of an issue since the matter can be decomposed into the soil. Suitable groundwater is important because some areas may rely on groundwater wells to grow crops. Contaminated water will lead to contaminated produce or even no produce at all. However, is a nation-wide implementation of traditional practices actually a viable solution? In *Dai's Garden*, it is stated that a traditional farm 'produces the same amount of food per acre as those using chemical fertilizers and pesticides' across the span of 7 years (Dai's Garden, 2017). However, it is also explained that this takes significantly more time and effort from the farmers. It isn't realistic to force all farmers into working in these conditions. Furthermore, as China continues to implement deglobalizing policies, stress on China's agriculture will only increase as pork and soybean imports from the US are impacted (Gries, 2023). Traditional practices will struggle to keep up with an increasing and changing demand for food across the nation. Traditional practices were only developed for certain food, the techniques, and the soil itself, may not be able to facilitate a change in produce.

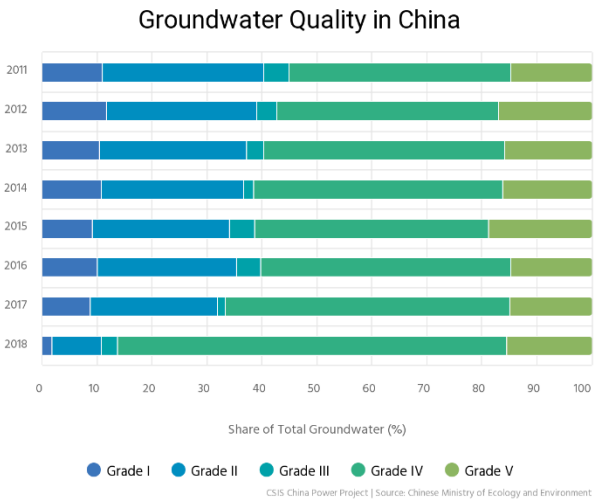

Figure 2 - Groundwater quality across China (ChinaPower Project, 2017)

Agriculture is an industry that is considered to have been affected the least by smart technologies. China is a nation that is investigating how this can be changed. This has led to innovative agricultural practices being tested, often including the application of AI and drones, in order to achieve more efficient farming outputs. AI is particularly useful in achieving greater food safety. A proposed

method is called ‘precision agriculture’, in which AI is used to monitor crop moisture, soil composition and temperature (Young, 2020). The AI uses the information to calculate the optimal amount of water and fertilizer to use. This has multiple benefits for food safety; firstly, being able to analyse soil composition is useful to measure whether the land or water is contaminated. It also ensures that crops aren’t over fertilized, and that water is used most efficiently – meaning that farmers are less likely to rely on contaminated water to grow their crops. Smart technology also allows for techniques such as ‘Smart greenhouses’ or ‘Urban Farms’, in which plants can be grown under strictly monitored and controlled conditions. Every aspect of a plants growth can be monitored which results in optimized and healthy produce. Evidence shows that China will be investing in these Smart technologies to solve their food safety crisis. Huge Chinese businesses like Taobao, Tencent and Alibaba are exploring new ways to apply smart technology into agriculture (Cheng, 2022), and ‘The 14th Five Year Plan’ is focussed on modernizing agriculture across the nation, underlining the fact that it must be done quickly (Cheng, 2022).

In conclusion, both traditional and innovative agricultural practices success in providing healthy produce that can offer the nation greater food safety. However, traditional practices may not be able to keep up with increasing and changing demands. A lack of food security will always lead to a lack of food safety as suppliers and farmers get desperate to meet quotas and consumers will get desperate and eat unhealthy, and potentially unregulated food. This is why innovative practices are more attractive as they offer optimized agricultural output and ensure that the produce is not contaminated in any way. They also open the scope of farming into urban areas. The nation’s agriculture will no longer be restricted to the arable land, but now into towns and cities, thus increasing total output and providing a secure supply of safe food for the entire nation.

11095036 1457 words

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