A Brighter Future through Sustainable Farming and Ethical Practices

There are two major objectives in an animal's life: to survive and reproduce. These processes are driven by food - the fuel of nature's engine. Humans are no different, and since the dawn of man there has been a constant struggle over these life-sustaining resources. The driving force behind every civilization in history is the need for food, and the incentive for technological advancements for thousands of years was the amelioration of agriculture, aimed at cultivating as much food as possible using minimal space. All of this has accumulated towards a modern age in which humans have achieved a global food surplus that is capable of feeding over 10 billion people, helping contribute to a rising feeling of food security. Despite this, hundreds of millions of people around the world continue to live in relative food poverty because of improper distribution, among other factors, as overproduction exists especially within the US and European Union. Although overproduction may seem to benefit those in areas of access by giving them more options and surplus, it actually ends up creating immense waste, has little effect on those who need help the most, disrupts world markets, and drains water supplies and soil nutrients, causing immeasurable environmental damages. However, as the world's population continues to rise, just recently crossing 8 billion in November of 2022, the sheer amount of food required to adequately sustain everyone is likewise surging. Unfortunately, humans are increasingly dependent on unsustainable farming practices that are worsening the environment and exploiting labor and animals in order to obtain this food. Nevertheless, although mass consumption and high demand have resulted in the inhumane treatment of farm animals, destruction of environments, and devastation of mineral-rich soils, there is still time to undo the damages we've done to our planet and fix our unjust, impractical methods of

cultivation. Without immediate action, the absentminded decimation of the Earth's biodiversity and natural resources will cause the degradation of our planet's finite resources, negatively impacting our lives today and in the many years to come.

Although the topic has been hotly considered for decades, humans have had yet to resolve the issue of unsustainable, unethical farming practices, namely animal mistreatment, over-farming, and pollution. Media attention has largely focused on animal exploitation, giving rise to various organizations like PETA and causing the growth in popularity of vegan and vegetarian lifestyles. While industrial farms are the most efficient, effective form of animal husbandry, making up almost ninety percent of the world's total meat production, their successes have only been made possible through the mass confinement of animals in unsanitary living conditions, where they are treated as production units rather than sentient, living beings. An article from the Animal Welfare Institute states that "Four or more egg-laying hens are packed into a battery cage. . . pregnant sows spend each of their pregnancies confined to a gestation crate. . . growing pigs are confined to slatted, bare concrete floors. . . [dairy] cows spend their entire lives confined to concrete" (Animal Welfare Institute). In order to keep the cost of meat relatively low, animals are subjected to horrible lives, where many are never able to even see the sun or breathe fresh, clean air. They live with barely enough space to move around and are forced to undergo artificial insemination and painful mutilations, which have been shown to lead to higher chances of infections, often leading to lower quality and even diseased products (Roberson). The ethical aspect aside, animal agriculture at the level we maintain today requires immense amounts of water, accounting for roughly half of the water consumption in the US alone, and the destruction of natural habitats to create grazing land. Furthermore, this system has led to tremendous air pollution, as animals account for 65% of the world's nitrous oxide

emissions and 15% of total greenhouse gas emissions, impacting global warming at a rate almost 300 times greater than carbon dioxide (Conzachi). Fish farms similarly result in extensive water pollution, causing parasites and disease to develop in fish, which can carry over to the consumers. Moreover, overfishing has resulted in greater ecological extinction on coastal ecosystems than any other human influence in history. The deliberate elimination of necessary predators and keystone species to make room for farm animals has ruined the delicate balance between predator and prey, allowing for the collapse of ecosystems around the world. Meat farming is not the only example of exploitative and hurtful agricultural practices, however, as "Eighty percent of global deforestation is a result of agricultural production, which is also the leading cause of habitat destruction" (Behring). The destruction of natural environments for farming space has pushed hundreds of species to the brink of extinction, having irreversible implications on the biodiversity of the Earth. The excessive use of pesticides and harmful fertilizers have led to nutrient deficiencies in soil and water pollution, contaminating drinkable freshwater and infecting marine ecosystems. Over-farming in its own right has led to soil erosion that has left soil infertile for future use.

While the growing need for more food has given way to exploitative, unsustainable practices in the agricultural industry, it's a common misconception that these operations are necessary to maintain a productive food supply. There are a number of different methods that farms can employ in order to avoid damaging the environment, namely Regenerative Farming, which attempts to mimic nature by minimizing tilling, in order to preserve natural soil aggregation, and utilizing crop rotations, in which different crops are planted on land each year to allow other nutrients in the soil to restore naturally. This technique requires significantly less chemicals than normal farming but produces similar yields, using natural fertilizers recycled

from sewage sludge and waste instead. Pasture rotations and controlled grazing for farm animals not only allow animals to live more freely but also prevents dense pollution within a single area. Field barriers are also easily adoptable techniques that prevent water pollution. Natural blockades made up of trees and shrubs planted between crops and bodies of water can stop harmful pesticides and herbicides from flowing into these water sources, using their roots to strengthen contaminated sediment that could otherwise break off and pollute a nearby river. Regulations on fishing nets and greater protections on endangered species can prevent harmful fishing, and the faster development and more widespread acceptance of meat substitutes could eventually eliminate the need for large, industrial farms, removing one of the leading consumers of water, causers of pollution, and locations of animal mistreatment. Although it may seem like exploitative industrial farming is the only way for enough food to be cultivated to sustain the world's growing population, there are a myriad of alternatives that can save the environment while having little impact on our existing crop yields.

Despite these issues being relatively straightforward, many people still remain unconvinced and unwilling to make the necessary changes because they don't directly impact them or because costs could rise slightly in the wake of these differences. However, in reality, unsafe and unsustainable practices have immense consequences that not only affect the entire world today but also will affect generations to come. The unprecedented levels of global warming, brought on primarily by animal-caused greenhouse gas emissions, has caused the average temperature around the world to rise and average rainfall per year to vary harshly. Not only does this cause human discomfort but it also ruins delicate ecosystems dependent on specific environments, leading to the mass migration of animals to higher latitudes which has left certain areas overcrowded and caused others to become desolate and slowly die off. Hotter

temperatures, increasingly frequent droughts, and heavier rains inhibit plant growth and promote soil erosion, causing lower crop yields and hurting farmland which both contribute to rising costs of food. Ocean warming has likewise killed off marine environments like coral reefs and accelerated the melting of icebergs, raising the water level of oceans everywhere around the world. This could have immense consequences for humans, as those living in areas located beneath the sea level could be forced to relocate, not only creating a multitude of social issues but also decreasing the total amount of habitable land for the already enormous human population. Air pollution suffocates entire ecosystems, weakens plants, and causes cancer, strokes, and heart attacks in humans, accounting for "one in three deaths from strokes, lung cancer and chronic respiratory disease" (Client Earth). Water pollution from pesticides and animal waste can poison fresh water, making it unsafe for consumption and causing diseases such as cholera or typhoid fever. Although restoration projects are primarily aimed towards a better future, they have been shown to have immediate benefits for millions of people as well. For example, a project aimed at restoring 3.7 million acres of degraded land in the Loess Plateau in China helped in bringing 2.5 million people out of poverty, doubling farmer's incomes, diversifying employment, revitalizing the environment, and increasing grain production by 60%, which reduced hunger and starvation rates in the region dramatically (World Bank Group). Although it may seem like ethical, sustainable farming methods show little real-world benefits, the future of human society relies on the rapid switch to these safer practices.

The need for food is constant and ever-growing, and industrialization as well as the advancement of farming technologies have led to the creation and success of huge industrial farms. Although these farms combine high yield with low costs, they also create a system which neglects farm animals and practices unsafe methods in order to maximize profits. Mistreatment

of the environment has created disastrous amounts of air, water, and land pollution that is slowly killing the Earth and having direct, lasting, and negative impacts on human health. However, while it may seem like it is too late or simply impractical to try to fix the agriculture industry, there are various preventative measures that farms can adopt in order to avoid harming the environment without greatly affecting yields. It's imperative that action be taken now in order to improve the scope of our future prospects towards a better, brighter future.

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