Hannah Thomascall

ASABE membership number: 1056048

hbt0007@auburn.edu

(334) 350-9143

Auburn University

Auburn, AL 36849
The Ethics of Sustainable Agricultural Practices

Sustainability is commonly defined as “development that meets the needs of the present generation without compromising the ability of future generations to meet their needs” (WCED 1987, 48). In the context of this paper, agricultural sustainability means reducing the consumption of resources such as water, chemical fertilizer, and soil, maintaining biodiversity, and creating less pollution — all while preserving the production rate. Without modifying the current agricultural practices, food production will be reduced dramatically when topsoil runs out in about 60 years (Arsenault 2017). Another drop in production will occur in approximately 75 years when the phosphorus mined to create fertilizer is depleted (“Phosphorus depletion: the invisible crisis.” 2011). Ethically, it is unacceptable to continue using resources at a rate that will leave future generations to starve, yet switching to sustainable farming may cause food shortages and economic hardship for many farmers now.

Monoculture farming became widespread in America after World War II to feed a rapidly growing population (“Industrial Food Production.” n.d.). However, there are several unsustainable aspects of monoculture farms that could be reduced or eliminated by switching to polycultural farming. In polyculture farming multiple species are grown together, as opposed to monoculture where only one species of crop is grown. Monoculture farms harm local wildlife. For example, bees do not get sufficient and balanced nutrients from one crop’s flower and because the crop all blooms at the same time they are left without a food source the rest of the year (Donaldson-Matasci 2013). Bees and other beneficial insects are also harmed by pesticides sprayed on the crops. Monoculture depletes the soil of essential nutrients by growing the same crops repeatedly in the same location. This leads to an increased need for chemical fertilizers — which are made using mined phosphorus. Runoff from fields is polluted by these chemical fertilizers and pesticides.
All of these negative environmental impacts can be ameliorated by adding cover crops to convert fields into polyculture farming. Cover crops are plants grown between the rows of the commercial crop. The cover crops are not harvested and are typically left to decompose on the field before being tilled back into the ground the following season to act as a fertilizer — reducing the need to add chemical fertilizers. Cover crops also add habitat for birds (which eat crop-damaging insects) as well as limiting the area available for weeds to grow, reducing the need for pesticides. Finally, cover crops provide an alternative food source for local animals which means better nutrition and longer access to food. Overall, transforming a monoculture farm to a polyculture farm with the addition of cover crops creates healthier soil, reduced need for added chemicals, cleaner runoff water, and a better habitat for local wildlife.

Large, remote farms are also unsustainable — whether they are polycultural or monocultural. In America, 20% of the farms produce 80% of the crops (Gleason 2014). The percent of the American population working in the agricultural industry dropped from 41% in 1900 to under 2% in 2000 (Dimitri, et al. n.d., 2). This represents a huge number of jobs lost and a significant concentration of the economic benefit of the agricultural industry. Switching to smaller farms would increase the percent of the population involved in farming and allow more people to benefit economically from this industry. Large, remote farms also mean that food has to travel a very long distance to get from farm to table. Food miles are a unit used to describe the carbon footprint of transporting the food, not just the physical distance the food travels. Interestingly, this means that food travelling from Asia to America by cargo ship actually has fewer food miles than food flown across America because of the relative efficiency of the respective modes of transportation (Leavens 2017). Local farms that use efficient transportation can significantly reduce the carbon footprint of food.

Despite the many benefits of sustainable farms, there are some obstacles to switching from large, monoculture farms: lower crop yields, increased cost, and reduced food diversity available to consumers. Monoculture farming produces more food at a lower cost due to having the same growing requirements
across the field and less diverse machinery needed. Growing only one crop also means that the crop tends to be chosen specifically for the climate and soil type and thus will have optimal growth and production (McGuire 2015). The increased costs of more workers, different seeds, and new machinery to plant and harvest crops may be passed onto the consumers and create food deserts where people are unable to afford the available food. Switching to sustainable farms also means a decrease in food miles. One disadvantage to reducing food miles is it decreases the diversity available to many consumers, especially those who live in areas not conducive to farming. Currently 1 in 6 people in the world are dependent on food imports and 34 countries are unable to produce enough food for their populations due to water or land limitations (Cago 2017). This means that reducing food miles is not realistic everywhere. The best way to improve the carbon footprint of food transportation right now is to reduce food miles where possible and use more efficient vehicles where food importation is required.

Now that some of the problems and benefits of sustainable farming have been stated, the ethical implications must be examined. Continuing farming with the current methods will lead to loss of topsoil and phosphorus for chemical fertilizer (among other things) which will cause a severe reduction in crop yield in the near future. Yet, switching to sustainable, local, biodiverse farms could cause economic hardship on farmers, increase food prices, decrease food variety for consumers, and reduce yield. It is unethical to deplete the resources needed to produce food for future generations, but it is also unethical to reduce the current food production and cause food shortages.

Different ethical theories resolve this dilemma in various ways. Utilitarianism argues that the morally correct option is the one that causes the greatest net happiness regardless of the motive behind the action (Duignan 2017). Therefore a utilitarian would believe sustainable farming must be implemented because a slight food shortage now would cause less unhappiness than future generations starving and not being able to produce food. Conversely, ethical egoism claims that actions should be performed only to maximize one’s self-interests (Shaver 2019). This theory would reason that sustainable agriculture should
not be implemented as it could cause negative effects now and the negative effects of continuing large, monoculture farms will occur after their lifetime.

There are several possible compromises that would partially satisfy both utilitarianism and ethical egoism — along with most other ethical theories. One compromise is crop rotation, which involves planting monoculture farms but changing the type of crop year to year. This provides many of the benefits of sustainable farming, including increased retention of soil nutrients, less need for fertilizers and biodiverse food sources for wildlife. Crop rotation also retains the increased yield of monoculture farming and can easily be enhanced with other sustainable farming practices like cover crops. This ethical compromise would allow the conservation of agricultural resources for future generations without compromising the current food production rates. Other compromises include vertical farming, hydroponics, and lab grown meats. These would all address some of the problems of monoculture, such as space and soil nutrients, while maintaining high yields.

Monoculture is widely used because it reduces costs for farmers and increases crop yield. Unfortunately, monoculture farming depletes the soil of nutrients, requires chemical fertilizers, needs large amounts of water, and harms local wildlife. Small, sustainable farms use techniques such as cover crops to mitigate these problems and reduce food miles and the associated pollution. The ethical dilemma of whether to switch to sustainable farms is viewed differently by various ethical theories. A compromise between monoculture and polyculture farming, like crop rotation, offers a favorable option for most ethical theories. There is no clear answer of what the moral option is in regards to sustainable farming; what works in one part of the world may not work everywhere and people disagree about what the top priority should be. However, improvements in sustainable farming are being made all over the world and new technologies may provide a better solution that is currently unimaginable.
References


